

—THE—

MAPES MANURES

—AND—

HOW TO USE THEM.

THE MAPES FORMULA AND PERUVIAN GUANO CO.

WORKS AT NEWARK, N. J.

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PRESENTED BY

Begent & Wilcox,

Groton, N. Y.

KEEP THIS DESCRIPTIVE PAMPHLET FOR REFERENCE.

The Directions for Use of the Mapes Manures are given in full in this Descriptive Pamphlet, and they will not be repeated, as formerly, in our Annual and Special issues.

We publish Special Pamphlets or Circulars on Potato, Truck, Cabbage, Cauliflower, Tobacco, and Asparagus Growing; also on Orange and Fruit Culture, particularly in Florida. Any of these will be mailed free on application to us or to our agents.

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The Mapes Manures.

THE CHOICE QUALITY OF THE MATERIALS USED.

The basis of the Mapes Manures is pure bone. The other materials added are all of the *highest grade* and *best known forms* of plant-food, such as Sulphate of Ammonia, Nitrate of Soda, Peruvian Guano, ground dried Pure Blood, dried Pure Flesh, Soluble High Grade Potash, Magnesia, etc., all *intimately* blended together, in fine mechanical condition, in the PROPER PROPORTIONS and in the forms best adapted to meet the demands of the trees and fruits, as well as for other crops for which they are recommended.

All the Phosphoric Acid is from pure Animal Bone (not petrified) and Peruvian Guano.

The above-named materials are not only the highest grade materials, but are the CHOICEST of the best class. They are not only materials of the highest grade, but they include those that are in themselves, without further manipulation, fertilizers of world-renowned merit. Peruvian Guano and Sulphate of Ammonia are used by the Mapes Company more largely than by any other manufacturers in this country.

We state emphatically that we have never used any S. C. Rock, or Phosphates of Iron or of Alumina, in any of our Complete or Special Crop Manures, and we stand ready to pay \$10,000 to any one proving the contrary.

We use no Rock, Horn, Leather, Marl, or any other inferior ingredients. All the materials used are of the very *choicest quality* and of high concentration.

EXCELLENT MECHANICAL CONDITION.

All these manures are fine, dry, in superior mechanical condition for use in machine drills or for application by hand. They are free from stickiness and dampness.

NO LOSS BY EXPOSURE.

These manures do not deteriorate by keeping. All the ammonia is "fixed" and safe from evaporation. Even when exposed on surface of the ground, or when used as a top-dressing in Spring or Fall, the waste in the fertilizer is very slight. When applied to cultivated crops the sooner and more thoroughly they are harrowed or worked into the ground, the sooner and more evenly they will reach the roots and the sooner they will feed the crop.

The loss, if any, by leaching is very slight, and is mainly confined to the nitrates. This is important only when the ground is left in the Fall bare of vegetation or without a crop.

FULL DIRECTIONS WITH EACH PACKAGE.

Each bag (200 lbs.) is plainly branded, besides having a tag attached upon which are printed the FULL DIRECTIONS FOR USE, and also Guaranteed Analysis, so that there can be no confusion or difficulty in their proper use, even when several brands are received at the same time.

IMPROVEMENT OF THE LAND.

These manures may be used with or without stable manure, broadcast or well-scattered in the hills or rows. Abundant experience of hundreds of farmers and truckers within fifty miles of New York, many having used these manures almost exclusively for ten years, shows that by their use, *without any stable manure*, land can be brought up into rich condition and made to produce, at half the cost of purchased stable manure, larger crops continuously *each year* and the land made stronger each year. The demand for these manures is mainly from farmers and truckers who farm only for profit, and who dispensed with the use of super-

phosphates, fish guano, poudrette and other one-sided, incomplete, stimulating fertilizers many years ago. Many truckers use one ton annually per acre, and many farmers use in their rotations equivalent to six or seven hundred pounds annually per acre, and they find it pays better than any system previously practiced. Their crops are nearly doubled as compared with former years, and cost little if any more money. [See "A rotation—five crops—one ton of fertilizers in five years," page 6.]

LARGE APPLICATIONS PAY THE BEST.

Many farmers who, when they commenced using these manures, used say 200 lbs. per acre in the hills, merely "to start the crop with," have found by experience that their crops pay much better if they use three, four, or even ten bags of Mapes Manures per acre, depending upon condition of land and crops to be grown.

AFTER-APPLICATIONS AT HOEING OR CULTIVATING.

Any of these manures may be applied with advantage at any hoeing or cultivation of the crop. Large and profitable increase in yield has been produced by 300 to 500 lbs. applied per acre between rows of Potatoes, Corn, Cabbage, Tobacco and Vegetables at second hoeings. In the case of a crop of Potatoes, twenty acres where 1,000 lbs. per acre had been used, an additional application of 500 lbs. on one acre when vines were five inches high increased the yield to 355 bushels, being 115 bushels over the average yield per acre of balance of the field.

Importance of Dealing Only with Reliable Houses.

PROF. JOHNSON states that it is not always practicable in the analysis of a commercial fertilizer to distinguish some of the best from some of the poorest forms of the ingredients. For instance, an analysis may not determine whether the nitrogen of a fertilizer is derived from blood or animal matter, or from leather or shoddy.—*Rural New Yorker*.

Can chemists tell whether the nitrogen of chemical fertilizers comes from hair, leather, rags, horn, shavings, or from flesh, blood, or other sources in which it is available as plant-food? Can chemists tell us whether phosphoric acid comes from rock or from bones? If not, to what extent can we rely upon the analyses which are given in the reports of the State Agricultural Stations? Truly we must trust to the honesty of chemical fertilizer manufacturers to a great extent, after all.—*Rural New Yorker*.

NOTE.—The Mapes Company have for years past extended invitations to the Chemists of the State Agricultural Stations to visit at any time, without notice, their works near Newark, N. J., and examine materials and take samples for analysis—not only of manufactured stock, but also of any and all raw materials. The Director and Chemist of New Jersey State Experiment Station have visited the works and taken samples several times.

Credit and Liberal Inducements Necessary to Sell Low Grade Goods.

The *Connecticut Farmer*, in discussing the evils of the credit system, states: "The cash purchaser is wronged, unavoidably so, by having to share the burdens of these credits. Because the MAPES COMPANY, more than any other in the field, refuse to burden themselves with such credits, they are able—and perhaps only on this account—TO BRING THE AGRICULTURAL EXPERIMENT STATE STATION'S ANALYSES FIGURES OF COST AND VALUATION SO NEAR TOGETHER."

The Mapes Potato Manure.

GUARANTEED ANALYSIS.

Ammonia, 4.50 to 5 per cent.; Phosphoric Acid, 8 to 10 per cent. (soluble and available, 8 per cent.); Soluble Potash, actual 6 to 8 per cent., all as high grade Sulphate and in forms free from Murates (or Chlorides); Magnesia, Lime, etc., 77 to 81 per cent.

DIRECTIONS FOR USE ON POTATOES.

May be used in the hills or rows, mixing and covering with earth, provided it is *scattered well*. Scatter it down the rows, mix as thoroughly as possible in any manner which best commends itself, with plow, hoe, brush, sled, chain, etc. Use three bags (200 lbs. each) and upward per acre on ordinary land.

The quantity of this manure may be increased to one ton per acre, and this quantity is successfully used by many growers, particularly when Potato crop is followed by wheat, grass, corn, etc. Where one ton is used per acre apply 1,000 lbs. broadcast *after* plowing, mix and level down with an Acme or common smoothing harrow. Scatter 500 lbs. in the furrows before planting, and apply at first hoeing on sides of the rows 500 lbs. more, or scatter 1,000 lbs. per acre in furrows before planting. With any ordinary care in mixing in the fertilizer in furrows with small plow or brush, no injury will be done to the tubers.

We claim that this is a COMPLETE MANURE for potatoes, requiring the addition of neither stable manure nor any other fertilizer. Many of the largest growers, who aim for QUALITY as well as QUANTITY of crop, use it exclusively.

This manure while not as *forcing* as the VEGETABLE MANURE, yet may be used as a substitute for the same, is well adapted for ALL VEGETABLES, at planting or ANY HOEING, particularly where starch and sugar formation is desired—superior quality of crop as well as large yield; also for SWEET POTATOES, ASPARAGUS, SUGAR CANE, SWEET CORN, SUGAR BEET, STRAWBERRIES and all small fruits—PEARS, GRAPES, and general fruit growing.

A Rotation—Five Crops—One Ton of Fertilizer in Five Years.

1st year, Potatoes, with one ton Mapes Potato Manure.

2d “ Wheat, no fertilizer.

3d “ Grass, no fertilizer.

4th “ Grass, no fertilizer—plowed under in Fall.

5th “ Corn (on sod) manured with farm manure.

Then potatoes again. Oats may be introduced after potatoes or *after* corn.

This rotation admits of moderate cost for the five crops, and at same time is heavy and profitable manuring for potatoes. Even failure of the potatoes leaves the land in good heart for wheat.

In this rotation, let a beginning be made, say with corn:—The corn is planted on sod ground and manured entirely with farm manure, or with the special Corn Manure, or farm manure broadcast, and Corn Manure or “A” Brand scattered in the hills or along the drills. Follow with potatoes, using 1,500 or 2,000 pounds of Potato Manure per acre—the larger quantity is the more profitable on the potatoes, and no further manuring will be required for three years—one wheat crop and two grass crops.

In applying the Potato Manure, use broadcast after plowing and before harrowing 1,000 lbs. per acre. Strew 500 lbs. in the furrows or in and around the hills, another 500 lbs. at hoeing or cultivating. This makes one ton to the acre.

Use no farm manure on the potatoes. Reserve it for the cornfields, as this crop, with its strong, rank feeding-powers and long-growing season, can feed on it better than potatoes or even the wheat. Much labor will be saved and the potato crop will be finer, healthier, and larger than with farm-yard manure.

Oats can be included and grown after the potatoes or after the corn. The oats should be fertilized, if after the corn, with a light dressing; say 400 lbs. Oats pay if manured and the season be a *fairly moist one*.

See pamphlet, “Chemicals and Clover,” for full account of farms brought up from poor condition to high fertility, by the Mapes system of Manuring and Rotation, with profit from the start.

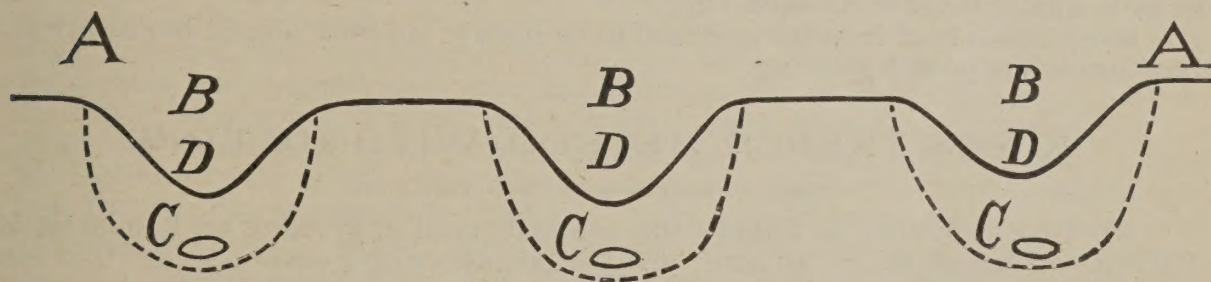
Best Practical Methods, as Pursued by Well-Known and Successful Potato Growers in Field Culture.

The advantages of perfect tilth of soil, particularly above the potato seed pieces, has long been felt, but the deep-spading trench method, in spite of the large yields obtained, has failed to be adopted for field culture on account of the expense. The following methods possess nearly all the advantages of the deep (spaded) trenches, and, at the same time, are very little, if any, more expensive than the ordinary or old-fashioned methods.

METHOD NO. I.—(ADAPTED FOR FIELD CULTURE ON AVERAGE POTATO LANDS.)

Land is plowed as deep as the soil will admit of (six to eight inches, or even more), then thoroughly pulverized, say with disk or tooth harrow; furrows as deep as possible (eight inches or over) struck out three feet apart, and Mapes Potato Manure cast broadcast all over the entire surface, *including the furrows*. There will not be a sufficient quantity accumulate in the furrows to do any harm.

Seed pieces are dropped fifteen inches apart when furrows are three feet apart, or twelve inches if the furrows are three and a half feet apart. A smoothing-harrow or cedar-brush is run diagonally, or aslant, so as to lightly cover the seed pieces, avoiding filling the furrows more than say two inches. If a ridger be used, it should be run lengthwise with the furrows, and care taken not to fill them. The following diagram represents the furrow with the seed pieces planted and covered:



- A. Surface of the field.
- B. The furrows. Shape when first struck out.
- C. The seed pieces.
- D. The surface in and out of furrows *after covering*.

When the potatoes "break ground," then the smoothing harrow or other implement is run again slantwise, but more nearly in the direction of the furrows than when covering the seed pieces, so that the land may be effectually cleaned of weeds and grass. At the same time avoid filling up the furrows or trenches nearer than within two or three inches of the level.



The above diagram represents the surface after this operation. After the potato vines come through again, the land is comparatively clean, and subsequent cultivation between the rows in customary way will gradually fill up the furrows or trenches and keep the field clean.

The above method is particularly adapted to field culture, as it combines the main advantages of the trench method—depressed furrows during the early growth, thorough tilth, protection against frost, and the least labor in keeping the field clean. This method is adapted to all average potato lands.

METHOD NO. 2.—(ADAPTED FOR FIELD CULTURE ON CLAY-LOAM, INCLINED TO HEAVY.)

The following method, employed for many years by Dr. W. S. Combs, D. C. Lewis, and many others in Monmouth, Middlesex, Burlington and Salem Counties, N. J., is here given as described by Mr. D. C. Lewis :

Plow the ground five or six inches deep, or as deep as the soil will stand it. Apply over entire field after plowing, but without harrowing, 500 lbs. of the Mapes Potato Manure with the Empire Grain Drill (tubes seven inches apart), as a broadcast dressing, running it with the furrows crosswise, or any way most convenient. The grain drill holds about 200 lbs. (one bag) of the fertilizer, and as emptied is refilled with the fertilizer, which is left in bags on field at a convenient distance. This takes the place and dispenses with the need of any harrowing. The grain drill leaves the field quite smooth, unless the ground is cloddy, when it is run over with a roller. The potatoes are planted with a potato planter, five inches deep, with 500 or 1,000 lbs. of the Mapes Potato Manure applied with the potato planter.

Mr. Lewis says he proposes to put in some fifteen acres or more next year, and to make a change in his method of planting. After the application of the fertilizer (500 lbs.) with a grain drill, he proposes to strike out the furrows three feet two inches apart and six inches deep, with a furrowing-sled carrying two double mold board plows making two furrows at once, and then run the potato planter down the furrows, distributing 500 lbs. more of the fertilizer, extending the full width of the furrow, planting and covering the potatoes four inches deep, and thus leaving the furrow depressed two inches. By subsequent cultivation with a Smalley Cultivator the weeds are kept down and the furrows filled up, so as to make flat cultivation. When potatoes are about one foot high he cultivates with a Riggs gang plow, drawing some of the earth each time toward the rows so as to finally leave them raised up.

Mr. Lewis's land is rather inclined to be heavy; in fact, almost too heavy for best success in potato growing.

ROSE'S TRENCH METHOD, WITH HILLING.

USED BY ALFRED ROSE, PENN YAN, N. Y.

Mr. Rose describes as follows the methods used in growing 128¼ bushels of Potatoes on one-eighth of an acre; also 501 bushels (with a severe drought) on one measured acre. Only the Mapes Potato Manure was used; 1,600 lbs. per acre.

The land was plowed 12 inches deep, trenches opened 8 inches deep (this leaves a mellow soil four inches below the seed). Trenches are left open and filled up as the vine grows. This gives a larger yield than if the trenches are filled when first planted. By *hilling* up there is more moisture retained in the rows in a dry time than by flat culture. My trench system has been adopted by many farmers, and they write me, before using it their yield was only 75 to 100 bushels per acre; their yield is now from 300 to 500 bushels per acre. By careful planting (rows three feet apart, seed one foot apart in the row, 14,520 hills to the acre, and three pounds to each hill equals 726 bushels), and suitable weather, yields of over 700 bushels are easily obtained, provided my trench system is employed and the Mapes Potato Manure, 1,600 lbs. (8 bags) per acre, is used.

HOW FERTILIZER WAS APPLIED.

I used at the rate of 1,600 lbs. per acre of the Mapes Potato Manure, one-half broadcast and the balance in the trenches after the seed was dropped and covered one to one and-a-half inches. No other manure whatever was used, either on my one acre plot or the one-eighth acre. I would advise potato growers to use the Mapes Potato Manure.

CUTTING SEED PIECES.

With these varieties a half eye, or even a quarter eye, will grow as many bushels as a whole eye. With half eyes we can plant much closer than with three or four eyes to the hill, and at the same time get as many pounds to the hill. With a half eye I can grow over twenty thousand (20,000) hills to the acre, which with a yield of three pounds to the hill, would be over 1,000 bushels to the acre.

Mr. Rose subsequently did raise with The Mapes Potato Manure exclusively on one measured acre 1,031 bushels potatoes, the largest crop in the Potato Growing Prize Contest of the *Farm Journal* and *American Agriculturist*. See Potato Pamphlet, 1891.

The Rural Trench Method as used on the Contest Plots.

[As described by E. S. CARMAN, Editor *Rural New Yorker*.]

PREVIOUS TREATMENT OF THE CONTEST PLOT.

Potatoes have been raised on the piece of ground of which the "Contest" plot was a part for 12 consecutive years. It has never received much manure. The applications of fertilizers each year have averaged, no doubt, at the rate of 1,200 lbs. to the acre, for the most part MAPES POTATO MANURE, with which, as with other brands, the *Rural*, as our readers well know, has been carrying on experiments of various kinds during the entire period, upon considerable areas as well as upon small plots. Besides the MAPES POTATO MANURE, the plot has received at various times, small dressings of lime, wood ashes (leached and unleached), kainit and raw-bone flour.

Owing to the lateness of the season, the "Contest" was not planted until April 20. The planting was begun at 7 a.m. At 8 a.m., a shower began which continued until the work was finished, causing the soil to become muddy on the surface. Previously (April 9th), the seed potatoes were spread out singly in a warm room. The eyes of the "seed ends" soon pushed, forming short warty shoots. The eyes of the other portions of the potatoes grew but slightly. The object of placing the seed potatoes in a warm, light room, was to secure the most vigorous "seed" for the Contest plot. All potatoes, the eyes of which seemed dormant or feeble, were rejected. They were cut according to the number of strong eyes developed, the object being to have at least three to a piece.

HOW PLANTED.

On April 18, the trenches were dug with a spade, about seven inches deep and a full foot in width. As we have not as yet determined whether it is better to strew the fertilizer *under* or *over* the seed, it was sown both under and over. Eight hundred and eighty pounds (880) were first evenly sown in the bottom of the trench, and incorporated with the soil by a Hexamer pronged hoe. On this, an inch or so of soil was raked, and the seed pieces were placed exactly one foot apart, the trenches being three feet, measuring from the middle of each. These were covered with another inch of soil, and powdered sulphur was scattered upon it at the rate of 400 pounds to the acre. Then an additional spread of the fertilizer (Mapes Potato*), at the rate of 880 pounds to the acre, was given, making in all 1,760 pounds to the acre. The trenches were then refilled with the soil taken out, which, being somewhat lighter than the rest, left the soil of the trenches higher than that between.

We are careful not to *compact* the trench soil any more than can be helped. The ridge left soon settles to the general level, and is so preserved during the season, as all hilling up is carefully avoided.

THE YIELD.

Friday, the 28th of September, every member of the committee appointed to determine the yield was present, together with some forty others from various parts of the country. The ground was carefully measured and found to be one-eighty-eighth of an acre. The No. 4 yielded at the rate of 644 bushels per acre. The No. 2 yielded at the astounding rate of 1,076 bushels to the acre. The No. 3 was a comparative failure, owing to the vines having been destroyed by the flea-beetle, and the yield was only at the rate of 276 bushels to the acre. As this potato occupied two-fifths of the entire plot, the average yield was thus reduced to below 700 bushels to the acre.

IS THE R. N. Y.'S TRENCH METHOD PRACTICABLE ON EXTENDED AREAS?

If by usual methods a farmer can raise 200 bushels of potatoes on an acre, how much additional time and expense can he afford, to raise 500 bushels?

The principle of the trench method is very easily applied to the field, let it be small or large. We use a common shovel plow to form the trenches, which will give the depth and width required. The soil may be returned to the trench either by a drag or by running the same plow between the trenches. The application of fertilizers and cultivation thereafter are as simple as those employed in ordinary practice.

Depth of planting, a mellow soil, ample plant food, and level cultivation, are the requisites essential to success.

* NOTE—We find the *average* of the Station analyses of the Mapes Potato Manure to be as follows: Ammonia, 5 to 6 per cent; Phosphoric Acid, 11 to 13 per cent; Potash, 6 to 8 per cent.—E. S. CARMAN.

SUPPOSED ADVANTAGES OF THE R. N. Y. TRENCH METHOD.

The enemies to large yields of potatoes are:—first, a deficient supply of suitable soluble food; second, drought; third, a compact medium in which to develop. Solubility of food can be secured only by *moisture*. The potato plant before the tubers begin to form needs no more moisture than most plants with succulent stems and leaves. The tubers are 80 per cent. water, and they develop and mature in a comparatively short period. When they are developing a full supply of moisture must be supplied or the potatoes are *checked*. Succeeding favorable weather can then induce only a second growth which, though it may add to the bulk of the crop, cannot increase its value.

Trenches, if of ample size, supply a mellow, congenial medium for the potatoes' growth. The roots freely extend whithersoever they will. In this unresisting soil the tubers form, grow and mature. The roots readily find their food, while the mellow, deep soil conserves moisture. It is well-known that surface cultivation in times of drought tends to hold the moisture underneath. The soil of the trenches—if properly made—acts, *throughout*, upon the same principle as the surface cultivation. The tubers and roots have nothing to overcome except the comparatively gentle resistance of a yielding soil. The moisture is conserved by porosity. The gentlest rains or even dews readily penetrate and permeate the loose soil; while evaporation is retarded by the foliage which soon covers the entire trench. Only *shallow, level* cultivation is given. By the old method, the plow or cultivator is run both ways, throwing furrows towards the plants. The fibrous roots are severed, while the plants are, in a measure, deprived of the means of gathering moisture, the severed roots being exposed to the direct action of air and sun, and the heaped up soil acting as a *shed* which carries the rain from where it is *most* needed to where it is *least* needed.

Finally. When potatoes are planted but two or three inches deep in furrows, the growing tubers are necessarily crowded in a very limited space. When planted six inches deep—provided always that the soil above is mellow—tuber-bearing stems issue, as it were, from *several different planes or stories*. There are several *tiers* of tubers fairly separated from one another, instead of being, as in the old way, crowded all together. The tubers formed in trenches are of better shape than those in hills, and it is rarely the case that they grow out of the soil, thus becoming sun-burnt and worthless. See following diagrams (ideal).



Some Leading Points on the Mapes Potato Manure, Rotation of Crops, etc.

In view of the strong testimony from the many practical and accepted authorities on Potato Growing, in favor of this manure, it is necessary for us only to call attention to

1st.—The greater certainty than with stable manure or any other fertilizer to bring a crop *under the most adverse circumstances*. The solubility and variety of the choicest forms of plant food, as used in this manure, enable it with *comparatively little moisture*, to meet all the varying demands of the crop at all its successive stages of growth. Lack of abundance of available plant food for full feeding during the time the tubers are forming often proves fatal to the crop. Stimulating or partial fertilizers give promise in vines but disappointment at harvest.

2d.—The quantity of the crop from the Mapes Potato Manure, by reason of generous feeding, the presence of the proper forms of plant food and absence of injurious materials (such as *Chlorine*) has uniformly been *superior to anything ever obtained before* the introduction of this manure. This has been repeatedly testified to by the prominent growers and members of the several State Agricultural Societies, Stations, Granges, Agricultural Journals and practical truckers in all sections, including such authorities as Dr. F. M. Hexamer, E. S. Brownell, E. S. Carman, Dr. Henry Stewart, J. T. Lovett, Alfred Rose, P. T. Quinn, Theodore F. Baker, Dr. W. S. Combs, and many others.

So great has been the influence of this manure on the quality of potatoes and vegetable crops, that practical large truckers claim that they can "*well afford to use it at double its cost if ONLY FOR THE SUPERIOR QUALITY OF THE CROP AND FREEDOM FROM DAMAGE BY GRUBS, WORMS, INSECTS, ETC.*"

3d.—Where potatoes are grown for three or four consecutive years exclusively with this manure, the effect of liberal feeding with varied and choice forms of plant food has been to steadily improve the quality of the tubers to such a degree that even when an *inferior potato*, but a larger yielder, like the "Peerless" or "Burbank" has been grown, it has more or less slowly been changed into a smooth, bright, highly-flavored, mealy (when cooked) potato, rivaling for table qualities the old "Peach Blow." In many cases the extra fine quality of these common grade potatoes has brought the growers fancy prices for market and for seed, frequently twenty-five per cent. advance on average market rates. Large yields of these potatoes, 400 to over 500 bushels per acre (with 1,000 to 1,500 lbs. of the Mapes Potato Manure), and sold at high prices, have not been uncommon.

4th.—All attempts on the parts of experimenters to improve upon this manure by mixing it with Nitrate of Soda, Sulphate of Ammonia, Dried Blood, etc., also have failed to render it more effective, either in quality or quantity of product. The addition of either stable or farm manure to the Mapes Potato Manure (when used in quantities of 1,500 lbs. per acre), has failed to improve the results, but on the contrary, the product in some cases was actually less satisfactory, both in yield and quantity. As Prof. C. A. Goessmann, Director of the Massachusetts Agricultural Station, in a recent address, truly states:

"An excessive accumulation in the soil of either animal or vegetable matter, or of both, is apt to turn it into a breeding place of injurious parasitic growth," and again:

"To manure our lands efficiently, means to-day something more than to incorporate into the soil an exceptionally liberal amount of some incidental refuse matter of ill-defined composition, as barnyard manure, vegetable composts or wood ashes."

5th.—Until the careful scientific experiments in growing potatoes were made, as in the "Rural Experiment Farm Tests," and those of the State Experiment Stations, Granges and others able to carry on the work, it has been supposed that the largest yields and best quality of results could be obtained from the use of well rotted stable manure; but now it is not well rotted stable manure, but the Mapes Potato Manure that is taken as the STANDARD for excellence of results, and in all the experiments and tests one of the objects has been to find a manure, fertilizer or mixture of chemicals that could "*beat it.*" But in none of these attempts have the experimenters been successful. Even in the several hundred experiments under the plan of Prof. Atwater for testing soils, none of the yields have approached those obtained by the Mapes Potato Manure, and the same is true when tested alongside of the most approved mixture of Ammonia Salts, Dissolved Bone and Potash Salts, tried at the "Rural Experiment Farms" and elsewhere. Scientific feeding of such crops as Potatoes, Strawberries, Fruits, Sugar Beets, Vegetables, and all quickly-growing, dainty-feeding crops, means a

good deal more than simply mixing three materials together which supply Nitrogen, Phosphoric Acid and Potash, irrespective of proper and varied forms.

Special forms adapted to the varied wants of the crops, and even of the same crop at successive stages of growth and changing surrounding conditions of moisture, temperature, etc., are of equal importance with simply making the soil rich. What will make a soil rich for onions will drive out and destroy a clover crop and cause other crops to result in inferior, tough, stringy, flavorless, insipid products, unfit for competition in the market or for the table.

Attempts to improve stable manure by adding Ammonia Salts, Dried Blood, etc., so as to "beat the Mapes Potato Manure," have also failed.

6th.—The popular view of fertilizers, that they are mainly effective in starting the crop, giving it a good "send off" but insufficient to supply "nature's food" for the normal and *healthy maturity* of the crop *throughout its growth*, is largely *true* with such fertilizers as Superphosphates, Fish Guano, Peruvian Guano, ordinary mixtures of chemicals, or even hen manure, bone (with or without wood ashes), plaster, etc.; but this estimate of the temporary effects of fertilizers is not applicable in any way to the Mapes Potato Manure or to any of the Mapes Special Crop Manures.

Readers of our pamphlets or of the agricultural press do not need to be reminded of the numerous instances in ordinary farm practice where a single application of the Mapes Potato Manure has not only brought a good potato crop on poor and average land, but has from its unexpended strength largely increased the succeeding crops, notably grass, for THREE TO FIVE YEARS. (See page 21.) Dr. Henry Stewart at Westwood, N. J.; Dr. W. S. Combs at Freehold, N. J.; Dr. T. M. Hexamer, and many others whose reports have been published in the leading agricultural journals and our pamphlets, may be quoted in verification of these claims.

7th.—No damage is found to result to the physical texture of the soil by the continued use of this Potato Manure, even *to the exclusion of stable or farm manure*. As Mr. Joseph Harris, in the *American Agriculturist*, well says:

"If the potatoes have food enough, they can dispense with the mechanical effect of barnyard manure." If you grow large crops you will not suffer for the want of vegetable matter in the soil, even with so limited a root-growing crop as potatoes.

Superphosphates versus a Complete Manure.

The thrifty farmer often asks himself: "Can I not grow as good a crop of potatoes with something that costs less than the Mapes Potato Manure?" In a recent number of the *Connecticut Farmer*, a valued correspondent, "Hockanum Farmer," says: "I quite agree with the correspondent (Dr. Henry Stewart) from Bergen County, N. J., that the Mapes Corn Manure has produced some wonderful results, as has also the Mapes Potato Manure. I consider them the best of the manufactured articles on the market, although there are others, some of them much cheaper, which have in *special instances* produced on a par with anything that can be claimed by the Mapes." We answer to this: "Yes, that is so; but so has Plaster, Salt, Nitrate of Soda, Superphosphates, etc., occasionally brought a large crop under favorable conditions, *but always in a soil that in itself was well supplied with plant-food*, and the crop was fed, not so much by any of these partial fertilizers, but from the resources of the land; and the land in consequence was made the *poorer*. As Dr. Lawes truly says: "Everything that brings a crop is not a manure, at least not in the true sense of the word." A fertilizer may act as a stimulant, and a superphosphate or plaster may, for all practical purposes, act the same as Peruvian Guano or Nitrate of Soda. It may help to dissolve the plant-food out of the soil and quicken from its own action the early growth of the plant, but the matured crop cannot get its full nourishment from any such *make-shift* or *whipper-in*;—it must be fed all around and with certainty by the manure applied, otherwise the manure cannot be expected to prove profitable in the long run or keep the land in condition. This is known to all observing farmers who grow corn on poor land with a "little phosphate in the hill," or wheat on poor land with a "little phosphate in the drill," particularly if they expect any good grass to follow.

Not a Superphosphate Wanted for Potatoes.

E. S. Carman, of the *Rural New Yorker*, in commenting on the large yields of potatoes obtained by him at the Rural Farm with his trench method and the Mapes Potato Manure, concludes: "But we don't want a 'Phosphate' or 'Super-phosphate' or an 'Ammoniated Superphosphate' or a 'Swiftsure,' or anything of the kind. We want a high grade potato manure."—[The *American Dairyman*, May, 1888.]

Mr. Carman, in the *Rural New Yorker*, July 4th, 1888, describes an "Ideal Fertilizer" as "one that furnishes the constituents in many different forms, all of which are available, though in varying degrees, to the varying requirements of plants at different stages of growth."

This is true, and we have urged its importance for many years in our pamphlets, and on all occasions. This explains the failure of tankings and many other single fertilizing materials, even with good analysis. Crops have varied wants and special demands in feeding.

Sweet Potatoes.

FOR THIS CROP USE THE "MAPES POTATO MANURE," OR THE
"COMPLETE MANURE" (FOR LIGHT SOILS).

METHOD OF APPLYING FERTILIZER FOR SWEET POTATOES.

Perhaps the best method for applying concentrated fertilizers to the land, for Sweet Potatoes, is as follows :

DRILL CULTURE.

After the land is prepared, plowed and harrowed, strike out the furrows or drills, say three and one-half feet apart. Let them be deep in very light land—lesser depth will answer on land better able to withstand drought. Then strew the fertilizer—say 1,000 lbs. per acre of the Mapes Potato Manure—in these furrows, being particular to distribute the fertilizer so it extends over, about six inches, *on either side of the furrows*. Then ridge over with plow or ridger. Set out the sprouts in the ridges, say twenty inches apart. This method is practiced with excellent results by some of the best growers, who use the Mapes Potato Manure alone.

HILL CULTURE.

In case the grower prefers to plant in hills, cultivating both ways; then, after the land is plowed and harrowed, and the furrows struck out one way at the desired distance apart, strew the fertilizer over and on each side of the furrow. Then, after ridging back with plow or ridger, cross-mark with marker and set the sprouts in the hills or cross-marks. When cultivation is begun, the fertilizer that was strewn *in the drills and between the hills* will be dragged out and then gathered back again in the process of hilling the crop.

The above method of applying the fertilizer is safer and more certain to reach the roots evenly and feed the crop than if dropped in the hills, and it will also save labor.

The Sweet Potato differs in chemical composition from the Irish Potato, mainly in containing nearly *seven per cent.* of soluble SUGAR in place of a similar amount of STARCH. "Its juices are so rich in sugar that the tuber keeps poorly, for whenever the cuticle is broken the common omnipresent fungi takes root, under favorable conditions of temperature and moisture, and rapidly penetrates the tissues, producing discoloration, and dry or wet rot."

The best fertilizer for Sweet Potatoes is the Mapes Potato Manure, particularly when *superior* table qualities are desired. Crops of Sweet (Round) Potatoes, 500 bushels and upward per acre, of finest quality, have repeatedly been grown in southern New Jersey exclusively with this manure—1,000 lbs. per acre.

It has formerly been believed that nothing but well-rotted stable manure would grow this crop successfully; so much so that when a crop grown with the Mapes Potato Manure was exhibited at the State Board of Agriculture in New Jersey, the Committee stated in its report:

"The strange part of this is that these potatoes have been *grown entirely* without stable manure, or manure of any kind other than the Mapes Fertilizer—1,000 lbs. per acre being used. This fertilizer was scattered in the row; the potatoes were planted June 1st, and yielded 560 bushels to the acre; a very large and handsome yellow sweet potato. Very creditable exhibit."

PROF. GEO. H. COOK, Director of the New Jersey Experiment Station, and member of the State Board of Agriculture, in referring to this crop (of Hon. Joseph B. Roe, of Gloucester County, N. J.), stated at the annual meeting of the Board:

"The growing of Sweet Potatoes is a very important industry in a considerable portion of our State, and of late the crop has shown signs of falling off and of deterioration in quality—yet here is a crop which shows that with proper fertilizers the quality and yield may be made as satisfactory as could be wished for."

The Mapes Corn Manure.

GUARANTEED ANALYSIS.

Ammonia, 4.50 to 5 per cent.; Phosphoric Acid, 10 to 12 per cent. (soluble and available, 8 to 10 per cent.); Soluble Potash, actual, 6 to 7 per cent.; Magnesia, Lime, etc., 76 to 80 per cent.

Also for Sweet Corn, Fodder Corn, Hungarian Grass, Millet, Late Turnips, Late Cabbage and Seeding to Grass.

DIRECTIONS FOR USE.

ON HEAVY OR AVERAGE GOOD LAND, particularly when stable manure is used broadcast, use ONE to TWO bags per acre, scattering well in and over hills and drills. The large amount of potash (so important to the crop in the later stages of growth) renders the careless use of this fertilizer *in the hill or drill* without scattering, unsafe.

ON LIGHT LANDS, use broadcast three bags per acre.

ON VERY LIGHT OR PLAIN LANDS, use broadcast four bags per acre.

The best plan for securing good growth *throughout the entire season and raising a large yield*, is to BROADCAST the fertilizer evenly over the whole field after plowing and harrow in. A portion of the fertilizer, say one or two bags (200 lbs. each) per acre, can be used in the hills, scattering well a small handful to each hill. Use three to four bags per acre.

Application at any hoeing or disturbance of the soil has always worked well.

This is a complete manure for corn and requires the use of no other fertilizer. It contains all the ingredients required to secure the *full development* of the crop, both in *abundance* of stalk of *improved feeding quality*, so important in ENSILAGE, and also in yield of *well-filled deep-kernelled ears*.

TO GROW PAYING CROPS OF CORN AND BRING UP POOR LAND.

This manure is adapted for BROADCAST use for growing Corn. Many light, sandy lands, "poor as poverty," like the Hartford "Plains," have by *broadcasting* three to four bags per acre of this manure, been brought up into good condition for grass or for any crop, and made to pay from the start. Lands otherwise *practically worthless*, made to produce, by annual applications, paying crops of corn from the start after liberal figuring for labor, interest and taxes, and brought up equal to the good lands. This cannot be done by using "*a little in the hill*," like a Superphosphate, "*to start the crop with*." With this manure such applications may RETARD, not PROMOTE early growth. It is intended for FEEDING (not stimulating) the crop through to its maturity, and also for bringing up and STRENGTHENING THE LAND. It is too concentrated and contains too much potash for safe use near the young roots. It is not needed specially *in the hills or drills*. The kernel of Corn is amply sufficient in its supplies of plant food for nourishing the young plant until its roots can reach the fertilizer scattered *around the hills or broadcast*. The Mapes Nitrogenized Superphosphate or "A" Brand may be used *in the hills* and with good effect when the land is strong, or manured *broadcast* with stable manure or Mapes Corn Manure.

The largest recorded crops of corn grown at least cost, without stable manure, have been grown with the Mapes Manure. These yields have been from 100 to 200 bushels of shelled corn per acre, and have been fully authenticated in the reports published and commented upon by the agricultural press and in our pamphlets.

The large and profitable crops of corn that have been grown on very poor land with the use of three or four bags of the Mapes Corn Manure per acre, reported in the agricultural press and in our pamphlets, have shown that corn (maize) can, with a suitable manure, be made a *renovating crop*, and that not only may profitable crops of corn be grown for successive years on most of the POOREST LAND, but that the same land *during the cropping is improved each year in strength* and put into good condition for grass, mowing pastures, or any other purpose. The large amount of fodder affords the means of increased supply of farm manure. Again, the roots and stubble of a good corn crop increases the stock of *humus-forming vegetable matter* in the soil and greatly improves the texture of the land.

1040 Bushels (Ears) of Corn grown on less than Four and one-half Acres with Mapes Corn Manure—Equal to 233½ Bushels per acre—or 116¾ Bushels Shelled Corn.

Report of the Corn Crop (1888) grown at the Rural Farm (*Rural New Yorker*), at Hewlett's, L. I. MR. CARMAN reports as follows.

Land (4 454-1000 acres) sandy loam—in sod since 1882—previous crops were wheat, oats, and corn.

Ten tons of farm manure, spread on the sod in March, 1888, and plowed under. 800 lbs. of the Mapes Corn Manure broadcast and harrowed in before planting, and 1000 lbs. additional of the Mapes Corn Manure scattered between the rows after corn was up. Corn (Chester County) planted in rows—made with the plow—four feet apart, and one foot apart in the rows.

Yield 1040 bushels of ears on the piece (4 454-1000 acres), equal to 233½ bushels (ears) per acre. This corn shells on the average about one-half, which makes the yield 520 bushels shelled corn on the plot—or 116¾ bushels per acre.

[From the *American Agriculturist*, June, 1888.]

* * * * *
“Now for a big Corn Crop.”—We need it; but why did not the writer tell us how to grow it. We often hear of one hundred bushels shelled corn per acre, but I never happened to see such a crop.*

You are right in recommending clean cultivation. It is the great secret of successful corn growing, with or without manure.

*NOTE BY THE EDITOR.—Yes, crops of one hundred bushels of shelled corn are rare, but they are not an impossibility. We have seen on the farm of Mr. E. S. Carman, on Long Island, a crop of one hundred and thirty-four (134) bushels of shelled corn raised on one acre of ground. The variety grown was Blount's Prolific, the soil a light sandy loam, the fertilizer used was Mapes Corn Manure, applied three or four times during the season—altogether not over a quarter of a ton—and the cultivation consisted of running a cultivator between the rows after every rain, and after the application of the fertilizer. The labor and expense bestowed upon this acre was not more than any intelligent farmer gives to his crop, if he expects a big yield. On the same farm four acres of Chester County Corn yielded eight hundred and fifty-six (856) bushels of ears—the best acre 159.37 bushels (shelled), the poorest 63.75; average, 113.69 (shelled) actual measurement.—EDS.

MR. CARMAN TELLS HOW IT WAS DONE.

[From the *Orange County Farmer*, January 31, 1888.]

EDITOR FARMER:—I take pleasure in replying to the request of J. M. L. made in your issue of June 7th. The kinds of corn which yielded all the way from 130 to 150 bushels (in round numbers) of shelled grain per acre were, on one acre, the so-called Blount Prolific; on the other field the Chester County Mammoth. The seed was drilled in with a corn planter about six inches apart, and thinned at the first hoeing so as to leave a plant every 14 inches as near as could be guessed at. The drills were marked four feet two inches apart. The fields were cultivated as often as was needed to keep the surface soil mellow, and all hilling was carefully avoided. The fertilizer (Mapes Corn) was sown broadcast at three different times, the first before planting, the second when the plants were knee high, and the last before the tassels appeared.

We were ourselves surprised at the promise of so great a yield, for which reason several well known persons were invited to measure the land and to order as many stacks husked as would serve them for a close estimate of the yield. For this purpose all needed assistance was provided. The actual yield as afterward measured, somewhat exceeded the estimate of the judges.

The land is a fertile, sandy loam, and the rotation, corn, oats, wheat, and finally clover with timothy. The season was very favorable for corn, being dry during the early part, with rains frequent enough in the latter part to prevent the leaves from curling at any time.

In general we ascribe this great yield to a favorable season, to a climate and soil well adapted to corn culture and to the varieties planted. In particular we ascribe the yield to (1) a thorough fitting of the soil; (2) to broadcast fertilization; (3) to drill planting, and (4) to shallow and (5) flat cultivation.

The judges who measured the land and estimated the yield were, writing them from memory: R. J. Dodge, C. E., Pres. N. Y. Farmers' Club; Dr. W. M. Habirshaw, Chemist N. Y. Ag'l Society; L. C. Benedict, agricultural editor *N. Y. World*; F. W. Bruggerhop, of the firm of Thorburn & Co. The crop was raised during the season of 1880. ELBERT S. CARMAN, Ed. *Rural New Yorker*.

NOTE:—Mr. T. D. Carman, father of E. S. Carman, has grown each successive year since 1880, on the same farm (East Rockaway, L. I.), with the Mapes Corn Manure, very large corn crops, yielding on two acres over 500 bushels of ears.

[From the *Practical Farmer*, Jan. 18th, 1890.]

REPORT ON CORN CROP, 1889, WITH THE MAPES CORN MANURE,
BY ALFRED ROSE, PENN YAN, N. Y.

213 Bushels Shelled Corn Grown on One Acre for the American
Agriculturist Prize.

MR. ROSE reports, December, 1889:

First one acre was measured; sides 14 rods long each, width 11 rods, 7 feet. Soil middling heavy loam and not under-drained. In 1887 and 1888 oats had been grown on the same, and about 10 cords of stable manure had been applied each year. Fore part of May, 1889, was plowed and cross-plowed, and 400 pounds of Mapes Corn Manure was then broadcasted on the same, harrowed in well, and marked for rows three feet apart. About the 20th of May planted the same to Early Mastodon Corn, 2 kernels each 12 inches apart in the row. When fairly up was nipped by the frost here and there, but not enough to injure it much. Now it rained, and then poured down in torrents, filling the ground full of water, and therefore we could not cultivate it, so we hoed it as best we could. As soon as the rain held up we cultivated and hoed again. After a few days the ground was drier, and I sent a man to cultivate again. When through, he says, "the corn is growing up out of sight, and the horse cannot be seen, it being away above his head." A few days later we broadcasted 400 pounds of Mapes Corn Manure between the rows and near the sides, then cultivated and hoed. Ears were now setting, and corn was 13 to 15 feet high. We shortly cultivated again and pulled up all weeds, then cut out all bastard stalks and many that were earing, also the tops of some that were earing, above the ear sets. This let more sun and air in on the corn. All stalks now had ears set. 20th of September the corn was topped, and no man tall enough to reach some of the ears, and many ears measured 14 inches around with husks on, and on some 34 to 36 rows of corn. On many stalks 2 and 3 ears each, and some 5, and some had 8 and 9 sets on, but only 2 to 3 large ears. The corn was husked the 6th of November. The *Agriculturist* agent was here and measured the acre, and was the same as before measured, and he weighed most of the corn and the three witnesses the balance. The net weight in the ear was 15,898 pounds. 7th of November the *Agriculturist* wrote to me to have the witnesses weigh out from the crib 300 pounds of average ears, then shell, and weigh the corn and the cobs. They did so, and two of the witnesses from their 100 pounds each had 75 pounds in kernels and 25 pounds of cobs, and the other witness 74¾ pounds in kernels and 25¼ pounds in cob—and wrote to the *Agriculturist*, and they wrote me that it was satisfactory. This makes 213 bushels of shelled corn grown on one acre and 25 tons of stalks.

The acre cost \$200.

Interest on one year.....	\$12 00	Planting	\$2 00
Mapes Corn Manure.....	17 50	Cultivating	3 00
Applying the same.....	1 00	Hoeing, 4 days	5 00
Plowing the same	3 50	Topping, 2 days	2 50
Dragging	50	Husking, 4 days	5 00
Seed.....	1 25	Cutting out stalks, 1 day	1 25
Marking out.....	50		
			55 00
			Paid witnesses and for affidavits..... 6 00
			\$61 00

Cost per bushel a fraction over 28¾ cents.

The official report of all the prize and leading Corn Crops (1889) were published in the March (1890) number of the *American Agriculturist*.

The only Prize WHEAT Crop grown with fertilizers in the *American Agriculturist* Prize Crop Contest, 1889, was raised by Mr. Bartholomew Gedney, Westchester Co., N. Y., with 600 lbs. of the Mapes Complete (wheat) Manure applied broadcast and harrowed in. Variety—WHITE BEARDLESS. Harvested July 2d, 1889. Yield, 46 bushels on one acre. Straw, 6347 lbs. Grain, 2750 lbs. One even or struck bushel weighed 60 lbs. Dimensions of contest acre, 290 4-10 x 150 feet. Entire cost, \$38.50.

The other Prize Wheat Crops were raised in Utah and the West with irrigation.

The Cornfield in Farming.

[Editorial in the *Massachusetts Ploughman*, Official Organ of the New England Agricultural Society.]

The grain of corn is as valuable to the Eastern farmer as the kernel of wheat is to the Western. Because the East looks to the West for its supply of wheat, it does not follow that it should likewise look to the West for its supply of Indian corn, that crop on which so much of the farm economy depends, and that maintains at an undeviating pace the farmer's prosperity.

The subject of corn planting has very recently been discussed on all its sides at the Farmers' Meetings held in Boston, the profit side included; and it is not necessary, therefore, to go over ground again that has been so well cultivated. Yet the subject continues to press none the less, as always a live one, upon the attention of farmers who are at all in earnest about the business they are engaged in. A staple crop, and one on which the chief reliance of our farms practically rests, it is important to remember the vital points for its profitable production. In the first place, then, the soil itself is inexhaustible, and is not to be complained of as worn out. It might as well be said of a strong man who can work no longer because he is without food, that there is no longer any vitality in or vigor in him. He only wants sustenance on which to recover his natural strength; and so a worn-out field calls for fertilizing food to enable it to produce as good crops as it ever did, or even better.

Three elements in plant-growth are wanting, in a greater or less degree, on soil that has been under cultivation for a long time. They are phosphoric acid, nitrogen, and potash. And while all crops demand a supply of these constituent elements, they demand it in varying amounts. Nitrogen is a most expensive ingredient, and yet most cheaply supplied to growing corn. It has been shown that while wheat requires from one-half to the full quantity of the total nitrogen supplied in a fertilizer—the condition of the soil being always taken into account, corn, even on comparatively poor soils, requires only about one-quarter of the nitrogen to be supplied as compared with what the crop contains. So that where, with the help of nitrogen, thirty-five bushels of wheat can be grown, we might expect to grow one hundred bushels of corn. Wheat has to be liberally fed with the needed nitrogen, while corn finds it for itself, whether in the soil or the air, or in both.

CORN NOT AN EXPENSIVE CROP TO GROW.

It was long the established theory, and held by Dr. Lawes of England, that corn belonged in the list of grain crops that require to be fed with a surplus of nitrogen; but Mr. Charles V. Mapes of New Jersey for years persisted that it should be classed with clover and the leguminous crops which yield such large quantities of nitrogen in their product, but require only a very limited supply. The opinion of Mr. Mapes has been fully confirmed by a great number of experiments and practical results in the field, and it is satisfactorily shown that Dr. Lawes is mistaken, probably from not knowing the habit of our corn crop in the field. This discovery wonderfully simplifies the problem of corn culture, so that the Eastern farmer is enabled to compete successfully with his Western rival in the production of this truly royal grain, or rather legumens. Keeping the soil frequently stirred, without regard to weeds, is of the first importance. It hastens growth, invigorates the plant, and assists it in its search for needed ingredients.

Five acres of planted corn may be thoroughly worked in a day with a horse-hoe, at a cost of thirty cents an acre, or twenty cents, reckoning that the horse would otherwise have been standing idle. If the planting is in drills, as it may be done by such constant working, from twenty-five to fifty per cent. more plants may be grown. But corn should be bred as animals are bred; that is to say, no barren corn-plants should be tolerated in a field. In the perfect corn-plant is always to be found the staminate, or male, flower, which is the tassel; and a pistillate, or female, flower, which is the silk. The imperfect or barren plant may be known from having the tassel but no silk. And as it not only bears no grain but perpetuates its own worthless kind by impregnating other only plants, it is to be shorn of the imperfect tassel, and in this way be bred out of the field. And with patience and skill, such as the grower of ornamental flowers displays, the number of ears on each stalk may be multiplied also. The breeding is of even more importance than the feeding, and the hundred-bushel shelled product may be doubled, by close attention to both.

Mapes Grass and Grain Spring Top-Dressing.

GUARANTEED ANALYSIS.

Ammonia, 5 to 7 per cent.; Phosphoric Acid, 7 to 9 per cent. (soluble and available, 5 to 7); Soluble Potash, actual, 5 to 7 per cent.; Magnesia, Lime, etc., 77 to 83 per cent.

It is fine, dry, suitable for sowing by hand or machine. Free from strong odor and stickiness.

DIRECTIONS FOR USE.

TOP-DRESSING.—GRASS. An easy way of securing an even scattering on the grass is to mix the fertilizer before use with land plaster, or even dry soil. The larger the bulk the easier to get the fertilizer evenly distributed.

This manure is intended for TOP-DRESSING IN SPRING, for all kinds of GRASS LANDS, Pastures, Mowing Lands, Lawns, etc. Use one to three bags per acre, BROADCAST, by hand or machine. On poor land use three bags per acre. Pastures, timothy, etc., apparently worn out, have been brought up into good condition by a SINGLE APPLICATION.

May also be used in the Fall. Also for top-dressing in *the Spring*, GRAIN CROPS, Wheat, Rye, etc., which have suffered by Winter exposure. Crops that otherwise would have returned little, if any more than the seed sown, have been made, by a single bag scattered evenly over the surface, in *very early* Spring, to bring a fair crop and greatly improved growth of the Timothy and Clover. Use one to three bags per acre.

This is a Complete Manure for Grass of all kinds. It is very active and soluble, and yet not subject to any loss either by evaporation or leaching. It promotes the growth of the best grass by furnishing full rations of all the constituents required. It is lasting in effects equally with the best stable manure, but at the same time it is quicker and more effective on the crop to which it is applied. Its introduction some ten years since marked a new era for restoring grass lands without plowing, among the farmers of Connecticut, New York, New Jersey and Pennsylvania. It is fine and dry, adapted for sowing by hand or machine, and is the least objectionable of all fertilizers in its absence from strong odors, stickiness, etc. It is surpassed in this respect only by our LAWN TOP-DRESSING HALF STRENGTH WITH PLASTER, prepared for lawns, parks, croquet grounds, shrubbery, etc., around dwellings.

IMPROVING OF PASTURES, MOWING LANDS, ETC.

It has long been known that Superphosphates, while they may sometimes improve the quality of grass, seldom increase the yield, and on the other hand, a nitrogenous manure, like fish, nitrate of soda or animal manure, while they produce a strong, vigorous growth, this growth is often a rank one, and though the grass be strong and dark colored, it is not nutritious, and not relished by the live stock. In the case of cattle droppings the grass may be strong and of good color, but the spots are avoided to the last moment by horses and cattle. A good dressing of hard wood ashes, together with pure fine ground bone, will generally improve both yield and quality of the grass, and the land will show the effects for many years; but the effects are slow, and pure hard wood ashes almost impossible to be obtained.

On poor lands the grass is slow-growing, tough, wiry and non-nutritious, while a thick stand of thrifty, quick-growing, properly fed grass cures tender and is highly nutritious. There are few farms where there are no one or more pastures, meadows, or mowing fields that are "too good to plow up" and yet they are not "doing well," and make poor returns for the capital invested. Just such lands can be brought up into good condition by top-dressing in early Spring with the Mapes Grass Spring Top-Dressing, one to three bags per acre. The effects will be quick, and the results in the increased yield and the improved quality of the grasses and strengthening of the land even superior to those from hard wood ashes and bone, and at less cost.

It is now generally admitted among the farmers who have used for years this top-dressing on their pastures and mowing lands, that they can be restored and fully maintained by annual top-dressings. Occasionally when the roots are poor it is necessary to make an extra seeding of mixed grasses, to get the best quality of grasses.

Henry Stewart, the well-known authority on dairy matters and general farming, recently writes of this manure in the *Rural New Yorker*: "As an instance of the rapid action of the Grass Top-Dressing (Mapes) I once applied 300 lbs. per acre to a field of orchard grass and clover. A rain stopped the work before noon, and the next noon, the ground being dried again, the line where I stopped sowing the fertilizer was distinctly visible by the darker green of the herbage, and it was not necessary to follow the stakes planted for this purpose."

THE MAPES GRASS TOP-DRESSING. ITS PRACTICAL USE IN SUSTAINING NEWLY SEEDED MEADOWS—EIGHT YEARS AND OVER—ALSO IN RENEWING OLD WORN-OUT MEADOWS.

[From THE GRASS AND HAY NUMBER of the *Rural New Yorker*, MAY 18, 1889, Editorial.]

ON CHEMICAL FERTILIZERS AND GRASS.

We give on following pages the views of some Eastern farmers, who use fertilizers with special reference to their effect upon the grass crop. They are all good farmers and speak from experience. We may say, in this connection, that it is our plan to work the *Rural* New Jersey farm into grass as soon as practicable. We are not able to do this all at once; we shall not be able to proceed any faster than the farmer in ordinary circumstances could do. Most of the farm, when we bought it, was in rough pasture fields, grown up to brush and weeds, or in worn-out, grassy cornfields that had been farmed "on shares." It is our plan to plow each year a few acres and apply all the stable manure we can secure, raising corn and giving careful cultivation. The next year potatoes will be grown with at least 1,500 pounds of a high-grade potato manure. In the fall the potato ground will be seeded to rye and timothy, with clover to follow in the spring. When all the area that we wish in grass is seeded, we shall apply manure to the grass. Until that time we shall use a "complete" grass manure. Whenever the yield falls below the standard, the grass will be plowed and the land given the regular rotation of corn and potatoes.

It will be noticed that a number of our correspondents speak of using chemicals in the work of restoring meadow fertility. Most of these persons live at the East, yet it will be noticed that a Western man (J. A. H.) asks for information that none but Eastern farmers can give him. Western farmers, as a rule, do not like to consider the possibility of being obliged to use chemicals. Stable manure and clover should measure the fertility of Western farms, and as clover depends more or less upon manure, it is safe to say that the quantity of manure made and saved on the farm should determine the fertility of that farm. This used to be the rule at the East, but industrial development has changed that. It simply does not pay farmers to make the amount of manure they made years ago. The West supplies us with meat cheaper than we can raise it. The forces of production and transportation have so arranged themselves that we find it cheaper to buy a portion of our manure in the form of fertilizers. In sections of this country where the dressed beef companies must look for their supplies of fat cattle there will probably never be any need for chemical fertilizers. Wherever the dressed meat handlers supplant local butchers, one of two things must follow: the dairy interests must be largely increased or farmers will be obliged to use more chemical fertilizers.

CHEMICAL FERTILIZERS FOR MEADOWS.

J. A. H., KENT COUNTY, MICHIGAN.—We have heard a good deal about the use of chemical fertilizers in MAINTAINING THE FERTILITY OF OUR MEADOWS, and it may be that Western farmers will be obliged to use these fertilizers in connection with stable manure. Will the *Rural* ask some of its Eastern farmer readers to tell us how the chemicals are most economically used?

Here are the answers sent by persons who "make farming pay:"

FROM JOS. WOOLWORTH, WESTFIELD, MASS.

Can newly seeded meadows be sustained for a series of years, or old grass lands be restored and made to produce large crops by the use of chemical fertilizers? I answer emphatically, yes. In support of the above I will give my experience in that line. I have about three acres of land seeded to timothy after tobacco in the fall with no other crop, and the two following years I cut two very heavy crops each year, without any dressing whatever. After the second year I usually look for a falling off in the crop unless in some way sustained, and by the fourth or fifth year at the farthest the land is ready for the plow again; but I have succeeded in keeping up the reputation of the two previous years by the application of about 300 pounds per acre of the Mapes Spring Top-dressing annually for five years, with a slight increase of fertilizers the last season. The grass the last season was not quite as tall apparently as it was the previous years, but it was

thick and heavy and it is evident the time will come when it will be advisable to plow and re-seed, unless it can be done by sowing on grass seed, which I meant to do last Fall or early this Spring. I have again dressed the same field with about 400 pounds per acre this Spring. This will be the EIGHTH YEAR SINCE it was seeded without a spoonful of barn-yard manure. I think I am within bounds when I say one dollar in fertilizers is as good as three dollars in barn-yard manure, besides the extra cost of hauling and handling the manure.

I add a pail full of water to each sack of 200 pounds, which prevents it flying and makes it as agreeable to sow as oats.

Now a word about renewing old meadows:

The same year in which I commenced the application of fertilizers to the above-named meadow I had another piece of meadow which had become badly run out and needed to be plowed or top-dressed. I plowed a part and left about one and one-half acres which was top-dressed with 300 lbs. of top-dressing. The first year the increase of crop was not particularly marked. The second year the crop was much better, and the third year it had about trebled in height and was very thick and heavy with a strong mixture of red and white clover. About the same dressing was applied for five years. The fifth year the crop was not quite as good and I inverted the sod last fall.

I am confident the best results can be obtained on newly seeded meadows, the roots being young and much more vigorous. Both the above plots lay on a much-traveled road and the successive big crops have attracted much attention, with the frequent remark that we "take the cake" on the big hay crops of Westfield, followed by the question: "How do you do it?" The answer is invariably, "*by the use of 300 lbs. of spring top-dressing annually.*" The question may be asked: "Why did you take up the one and one-half acre plot when it was always doing so well?" I answer, it had been down to grass many years and had become "turf-bound," as we call it, and though it was doing well it could be made to do much better by plowing and re-seeding, the same as all grass lands top-dressed with barn-yard manure for a series of years.

WESTFIELD, MASS.

FROM WM. C. SMITH, SOUTH CORINTH, N. Y.

I can certify from actual experiment during the last ten years, that the following method pursued for three or four consecutive years resulted in the production of remunerative crops, and the restoration of the land to grass; I sowed wheat and oats on several worn-out fields, drilling with the grain 400 to 500 pounds per acre of the Mapes Complete Manure "A" Brand, and at about the fourth or fifth crop seeded with clover and timothy after wheat. On other fields a top-dressing of ten two-horse loads of yard or stable manure was plowed in and 350 pounds per acre of fertilizer used in the hill and planted with corn, in some instances for two years or more in succession. Where no top-dressing was applied the same quantity of fertilizer per acre was sprinkled around the hills three or four inches from the stalks at the time of the last hoeing. On one or two fields twenty bushels of ashes were sown per acre previous to drilling in the grain and seeding. Five or six crops of grass have been mown from the above-mentioned fields, and I anticipate that several more crops of hay can be profitably harvested. Whenever an indication of lessening growth appears, a light dressing of fine yard manure composted with fertilizer will restore it at once. The fields thus restored are a moist loam, very retentive of moisture. By the aid of chemical analysis, and the labor-saving implements of husbandry, agriculture can be classed among the exact sciences. The sagacious tiller of the soil is enabled to verify the assertion made long ago, that "the desert shall rejoice and blossom as the rose." Our own loved poet in the last verse of his "Deserted Homestead" solved the problem when he said,

"With skill that spares your toiling hands,
And *chemic aid* that *science* brings,
Reclaim the waste and worn-out lands,
And reign thereon as Kings."

* Mr. Smith, in answer to a query, wrote:

"I intended to convey in the brief article addressed to the *Rural*, the fact that for several years in succession I drilled the fertilizer in the same fields, *first one way and then the other*, for both wheat and oats, until I thought a sufficient quantity of the fertilizer remained to produce grass, and then seeded—principally with wheat."

Top-Dressing Grass.—Permanent Effects.

Those who have not had experience with the Mapes Manures may feel that they are not sufficiently *lasting in effects* to do any permanent good on grass. They hear that "superphosphates," "guano," etc., may be "good enough for use in the hill," or "to start a crop with," but should not be expected to "hold out," and are therefore not, like stable manure, adapted for use on grass. The Complete and Special Crop Manures prepared by the Mapes Company are adapted to take the place of stable manure, and they have been proved to fully meet this end by thousands of practical farmers who, while they formerly relied exclusively on purchased New York stable manure, have long since ceased to buy it, and now depend entirely on the Mapes Manures. Our pamphlets are full of the strongest testimony on this point, given by practical and well-known successful farmers. The following testimonial, in the *New York Weekly Times*, by Dr. Henry Stewart, Agricultural Editor, is on the permanent effects of the Mapes Manures. Dr. Stewart relates that he used three bags of the Mapes Potato Manure per acre, applied in Spring, on three acres of the poorest worn-out land at Westwood, Bergen Co., N. J., (no manure or fertilizer of any kind having been used since), and produced six SUCCESSIVE CROPS (including potatoes, rye, Hungarian grass and sweet corn), concluding as follows: "There have thus been six crops taken from this field, and a seventh is growing, and it is absolutely certain not one would have been grown without the fertilizer (applied on the potatoes)."—*New York Times*.

Dr. Stewart also writes:

"When a field is so poor that it will not grow clover, then good artificial fertilizers are the only resource. They soon put the farm in a condition to make large quantities of manure." By this, Dr. Stewart means that by the largely increased quantity of feeding crops, corn, roots, grain crops and grass (timothy, clover and Hungarian) which can be grown with the fertilizers, that increased quantities of stock can be fed, and a larger manure pile will be the result.

Capital Invested in Grass Lands.

Hon. John E. Russell says in the *N. E. Farmer*, that we farm without enough capital, and that farmers lack confidence in their business. They can make no safer investment than in the improvement of their own farms—in smoothing rough mowings, in reclaiming low lands, in buying improved labor-saving tools and manure or standard fertilizers. No property in the country pays better than mowing land—it needs no insurance, no man can steal it, and its interest is never defaulted. A hundred dollars drawn from the savings bank, where it earns four or five dollars a year, and invested in enriching two or three acres of grass land, will double itself the third year in the hands of a good farmer.—*Rural New Yorker*.

The Mapes Lawn Top-Dressing (with Plaster).

For Lawns, Parks, Croquet Grounds, Base Ball and Cricket Grounds.

This preparation consists of THE LAWN TOP-DRESSING, full strength, reduced by admixture *with equal weight of very finely ground plaster*. It is prepared to meet the demand for a *Lawn-Dressing, all prepared ready for immediate application*, requiring no further mixing; scatter broadcast over lawns, grass, etc.

This fertilizer is free from odor, and especially adapted for use on lawns, flower-gardens, shrubbery, trees, vines, etc., *near the house*, also good for vegetable garden, grape-vines, fruits. If impracticable to work it into the ground, it may be left on the surface, and the rains will slowly take it down.

DIRECTIONS FOR USE.—Apply by hand or machine as evenly over the surface as possible, at time of seeding, or as a top-dressing at any stage of growth. The earlier in the Spring the better, as there will be more benefit derived from the Spring rains in dissolving the fertilizer.

Apply two to four bags per acre. On poor land double or treble the quantity may be used at time of seeding. For 2,500 square feet (size of city lot, 25 x 100), use 50 to 100 lbs.

May also be used, with or without stable manure, on vegetables and shrubs, vines, etc. Work in with rake or hoe around the plants as far as the roots extend.

ALEXANDER MECHIE, the well-known landscape gardener, writes to E. & J. C. Williams, Montclair, N. J.:

"My experience with the Mapes Manures, purchased of you for several years, and which I have used mostly for top-dressing lawns, has been uniformly satisfactory, producing a luxuriant and permanent growth of grass of that much admired velvety appearance. I am only surprised that so many will persist in covering their lawns for several months with coarse and unsightly manure in preference to using these fertilizers, which, for ease of application, cheapness and efficiency, are greatly superior."

**The Mapes Complete Manure for Light Soils,
or Vegetable Manure for all Soils.**

GUARANTEED ANALYSIS.

Ammonia, 6 to 8 per cent.; Phosphoric Acid, 8 to 10 per cent. (soluble and available, 6 to 8 per cent.); Soluble Potash (actual), 6 to 8 per cent.

This is our Special Manure for ONIONS and VEGETABLES (early and late) ON ALL KINDS OF SOILS. All vegetables require liberal supplies of soluble potash, and in the proper forms. Even with heavy or clay soils the natural supplies of potash are insufficient.

DIRECTIONS FOR USE.

For Onions, Celery, and Vegetables, use broadcast. 16 to 10 bags per acre.

" Asparagus, use broadcast—on new beds.....	3 to 5	" "
" " " —on old "	5 to 10	" "
" Sweet Potatoes.....	5 to 8	" "
" Wheat, Seeding with Grass, on light land.....	2 to 4	" "
" Grass, Seeding without Grain.....	2 to 3	" "
" Early Cabbages.....	6 to 10	" "
" Oats, on light land.....	1 to 2	" "
" Hungarian Grass, on light land.....	2 to 3	" "

It is safe to *drill* 200 lbs. (one bag) per acre. If any excess apply *broadcast*, or in drill *without seed*.

This manure is specially adapted for use by Truck growers ON ALL CLASSES of soil, with or without Stable Manure, for Early Vegetables, (including the following), insuring quick growth, tenderness and brightness, fine flavor, nutritious quality and *early* maturity—ONE TO TWO WEEKS earlier than by usual methods.

For Radishes, Lettuce, Beets, Onions, Peas and Beans, (green), Tomatoes, Cucumbers, Gherkins, Peppers, Spinach, Early Cabbage, Egg Plants, Early Turnips, Carrots, (Garden and Field), Squashes, Asparagus Beds, Melons, (see Index for Melons), Citron, Cauliflower, etc.

Until the introduction of Mapes Complete Manures among Truckers there was, apart from Stable Manure, seldom any fertilizer used by them excepting Peruvian Guano and a little Superphosphate or fine bone (dusted in the drill for making a quick start). There was no faith in a commercial manure taking the place, *even in part*, of stable manure, and little else was used except Peruvian Guano, and this solely for promoting quicker growth and early maturity without regard to *improvement in quality* of crop, or strengthening the land. It has frequently been claimed by truckers of late that they can afford to use the Mapes Potato Manure or Vegetable Manure, "even at DOUBLE THE COST, if only for the Superior Quality and freedom from damage by grubs, worms, etc., of the crop."

Many truckers have ceased to buy any stable manure, though located within a few miles of the city, where abundant supplies can be obtained at *very* much less than the prices formerly paid. They are buying the Mapes Vegetable and Potato Manures exclusively. So limited is the demand of the present time, and has been for three years past, for city Stable Manure among the truckers of Long Island and New Jersey, that the contractors are obliged to seek markets elsewhere.

The Mapes Vegetable Manure is the most concentrated and soluble manure EVER MADE. It corresponds very closely in the relative proportions of the ingredients with the very best quality of well-rotted stable manure, with the advantage in its favor of having ALL the plant-food ingredients AVAILABLE to the current crop, practically all soluble in the soil the *first season*, and yet not subject to waste, either by leaching or evaporation. What the crop does not reach remains for the next one. Its strength in feeding the current crop, as computed from the official analyses of the State Agricultural Stations for two years past, is FORTY TO FIFTY TIMES as great as average stable manure. But this SAVING in cost of soluble plant-food, carting, handling, spreading and avoidance of weed seed, etc., is not all. The great merit of this manure rests in the special *adaptation* of the varied forms of available plant-food that it contains, so as to best supply the ever-changing demands of the crops throughout their growth, particularly during extremes of weather, lack of moisture, low temperature, etc., and also to secure perfection of quality. As every trucker knows, the ability to meet competition and to make a profit largely depends on the quality, tenderness, soundness, etc., of the crop, as well as upon early maturity. These cannot be secured except through very rapid, vigorous and healthy growth.

Onions.

Use the Mapes VEGETABLE MANURE.

There is probably no crop that demands larger supplies of soluble and available plant-food for its successful growth. For this reason the growers of Onions formerly required two to three years of preparation of the ground for this crop. They would apply three to four times the usual quantity of farm manure to each of the several crops preceding the time for planting Onions. This was considered necessary, so as to accumulate in the land stores of soluble plant-food sufficient to meet the heavy demands of the Onion crops.

With the Mapes Onion Manure (Mapes Vegetable Manure) Onion growers have found that they can take lands adapted for Onion culture, of only average condition, and by applying broadcast from 1,600 to 2,000 lbs. of this manure *alone*—without any farm manure—can raise maximum crops of the best quality Onions *the first year*. These crops, grown in Orange County, N. Y., and Hartford and Fairfield Counties, Conn., have been reported in the agricultural press and our pamphlets, and have included crops of over 1,000 bushels per acre. Some of them were prize crops.

We do not recommend Superphosphates for Onions. Whenever a Superphosphate, with or without Nitrate of Soda, has grown a crop, it has been on land well supplied with soluble potash from previous manuring. The Onion crop demands especially large supplies of potash, and this element is not supplied at all in Nitrate of Soda, and to a very limited extent, if at all, in average Superphosphates. The land therefore, by such treatment, must become each year poorer—at least so far as regards potash. The prospects of success, particularly during adverse seasons, are largely increased by the use of a really *Complete* Manure, one which fully supplies the crop without getting the land out of condition.

DIRECTIONS FOR USE.—Apply broadcast 6 to 10 bags (200 lbs. each) per acre of the Mapes Vegetable Manure, after plowing and before harrowing. There is no advantage in applying any fertilizer in the drill. The roots soon reach *every square inch of space* between the rows.

Water Melons and Citrons.

Use the Mapes VEGETABLE MANURE.

The great desideratum for successfully growing Melons is to secure a steady supply of moisture around the roots, soil-moisture, during the entire season. Lands, no matter how light or poor, adjacent to water supplies—streams, etc.—are proverbially well adapted for Melons, as by soil saturation the moisture is ever present.

To secure similar conditions is the main object of the grower.

DIRECTIONS FOR USE.—We recommend that after the land is plowed and harrowed, deep furrows be made eight feet apart one way. One simple way of doing this is to turn with a single mould-board plow two furrows, one away from the other; then to deepen the furrows thus made by running again down the full length with the same plow or with double mould-board (or shovel) plow.

Strew in the bottom of the deep furrow coarse manure, straw and litter; then scatter the fertilizer over the coarse manure, extending over the furrow each side, making a strip four feet wide of the fertilizer, using say one pound for each plant or hill.

By doing it in this way the vegetable matter is kept well down in the ground, and when decomposed will provide a root pasturage for the plant, well supplied with both food and moisture.

The fertilizer, too, will not only be *under* the vegetable matter at the bottom of the furrows, but when the top soil, where it was also put, is plowed back to make the hills, it will be distributed and mixed with the ground the whole depth of the furrows.

For Melons: hills 8 ft. x 8 ft. will give nearly 700 per acre, requiring 700 lbs. of fertilizer.

For Citrons: hills 6 ft. x 6 ft. will give 1,200 hills, requiring, at one pound to the hill, 1,200 lbs. per acre.

The Mapes Fruit and Vine Manure.

GUARANTEED ANALYSIS.

Ammonia, 2 to 3 per cent.; Phosphoric Acid, 7 to 9 per cent. (soluble and available, 5 to 7 per cent.); Soluble Potash, actual, 10 to 12 per cent., all as high grade Sulphate and in forms free from Muriate (or Chlorides); Lime, Magnesia, Soda, etc., 76 to 80 per cent.

This manure is practically FREE FROM CHLORINE, so pernicious in culture of many fruits to quality, particularly when its use is continued.

This Manure is intended for Grapes (for market or wine), Strawberries, Raspberries, Currants and other Small Fruits, Apples, Oranges, and All Fruit Trees, also Nursery Stock.

ESPECIALLY ADAPTED FOR

developing the *fruiting* power, both in *quality* and *quantity* of fruit, also securing the *greatest vigor of the trees*, and thus protecting them from disease.

The improvements made in this Manure, consisting in nearly DOUBLING THE PROPORTION OF POTASH, and supplying the Potash *all in the best forms* known to fruit culture and science, make it the *most concentrated* and highest grade fruit manure ever offered.

DIRECTIONS FOR USE.—For Grapes: (For market or wine.) Apply broadcast three to four bags per acre to bearing vineyards, or one pound and upwards, well scattered around each vine. On young vines use one-half pound, more or less, scattering well and extending all around the vine and as *far* as convenient, so as to encourage *far-reaching root* growth. Work in the fertilizer as deeply and as thoroughly as practicable without injury to the roots, for while the fertilizer will not waste any by exposure, it will, if worked in, the sooner reach the roots. It is not desirable to encourage surface root-growing, and the roots naturally develop where they are best fed. These manures, no matter how heavily applied, will be carried down and distributed by the rains very slowly.

FOR STRAWBERRIES.—On New Beds: Use broadcast, harrowing in, and *before setting the plants*, five to ten bags per acre. If the land be light use ten bags.

On Old Beds: When there is danger of the fertilizer remaining *on the vines*, and the beds need stimulating, use "Orange Tree," or the still more forcing manure, "Complete for Heavy Soils." See "Strawberries" for special directions.

FOR SMALL FRUITS: Raspberries, Currants, etc.; three to four bags per acre broadcast.

FOR ORCHARDS: Apple, Pear, Plum, etc.; use three to four bags per acre, and resort to the other manures, the same as used for Grapes for making more *rapid* wood growth.

FOR NURSERY STOCK OF ALL KINDS: On strong or rich soil this manure will be found all-sufficient to insure the greatest vigor and health of the young trees, but on average or light soils the "Orange Tree Manure," three to four bags per acre, is recommended.

The effect of this fertilizer on all fruit, but on none more than on Grapes, is to DEVELOP the HIGHEST QUALITY OF FRUIT, richness in saccharine matter and flavoring organic compounds, together with MAXIMUM YIELD; but, more than this, it will secure sturdy vigor of the vines (but *not* especially *rapid growth*) and enable them the better to escape disease and attacks of all kinds from fungi, insects, etc., etc. On some soils the *wood-growth* may not be sufficiently vigorous, in which case occasional dressings of the Orange Tree or Complete Manure for Heavy Soils (Ammonia, 6 to 7 per cent.; Phosphoric Acid, 10 to 12 per cent., and Potash, 3 to 4 per cent.) will secure the necessary wood-growth without detriment to quality of fruit. HEALTHY, VIGOROUS WOOD-GROWTH is of course a necessity, but there is often a luxuriant growth without corresponding fruiting power, either in quantity or quality of bunches, still less in quality of the grapes for eating, or for wine-making—they are watery and flavorless, and lacking in saccharine and flavoring matters.

Stable Manure, Fish Tankings or any Nitrogenous Manures should be used with great caution in grape culture.

Strawberries.

NEW BEDS.—Use Fruit and Vine Manure, 1,000 to 2,000 lbs. per acre, broadcast, harrowing in before setting the plants. This renders the subsequent fertilizing comparatively easy. The Fruit and Vine Manure supplies abundant Potash and Bone, the most important ingredients for promoting the *fruiting* power of the plants and securing *quantity* and *quality* of crop. Potash, in any considerable quantity sufficient to meet the demands of the plant for *fruiting*, cannot be applied to strawberries except *before* the vines become matted, as any top-dressing, rich in potash, will be certain to damage them, particularly when it lodges on the stools. In applying large quantities of this manure in advance of its use by the crop there is no danger of loss, by leaching or in any other way, of either the Potash or Phosphates. Even the light soils hold on to them tenaciously for an indefinite number of years. On the other hand an application, *before setting out* the strawberry plants, of a fertilizer in which Ammonia (or Nitrogen) is abundant, is not economical; and for the reason that these elements are the most of all liable to waste and escape in the air and in the drain water; besides, Nitrogen and Ammonia are the most costly of all the fertilizer ingredients.

TO INCREASE VINE GROWTH use COMPLETE FOR HEAVY SOILS, Orange Tree Manure or Potato Manure. Either of these manures may be used liberally between the rows before they become covered by vines.

OLD BEDS.—Care must be taken in using any concentrated fertilizers to avoid letting it remain on the vines. A top-dressing with even a strong Potash fertilizer, however, may be made with perfect safety when the beds are covered with snow. The melting of the snow will safely carry the fertilizer into the ground. This is an excellent plan on level lands. Where old beds are cultivated with plow (with revolving disk or coulter) by cutting strips or paths, the fertilizer can be liberally strewed in the furrows or cultivated spaces.

In many cases the fertilizer is used broadcast without injury. The main danger is when it falls on the stools, from which the rain cannot readily wash it off.

The SAFEST Complete Manure we can recommend for Top-Dressing of Strawberry Beds is the Mapes Complete Manure for Heavy Soils. Use two or three bags per acre, scattering evenly around and over the vines.

Top-Dressing Strawberries.

The Mapes Potato Manure among the strawberry growers in this section, for top-dressing their fields, is better liked than even Peruvian Guano, which they have formerly used.

J. S. CARTER, Port Monmouth, N. J.

P. M. AUGUR on Strawberries, in "Rural New Yorker."

About Nitrate of Soda for Strawberries. I should say use it with extreme care. It is caustic in its effects if used in over-doses, carbonizing the rootlets and doing harm rather than good. I think sulphate of ammonia safer; but, better still, grain-fed horse manure previously applied, hen manure, or *some good specially prepared complete strawberry manure*, as the Mapes, etc. Nothing equals a previously well-enriched soil in perfect tilth for strawberries.

P. M. AUGUR.

J. H. HALE, of G. H. & J. H. HALE, Elm Fruit Farm and Nursery, South Glastonbury, Conn., Jan. 14th, 1889, writes:

The Mapes Fruit and Vine Manure gives *brighter colored, better flavored and firmer berries* than can *possibly be obtained with stable manure*.

STUDY THE STATE STATION ANALYSES.

EIGHT to NINE bags (200 lbs. each) of the Mapes Manures contain more pounds of the valuable plant-food ingredients, namely, Ammonia, Phosphoric Acid and Potash, and ALL IN THE CHOICEST FORMS, than TEN bags (200 lbs. each) or one ton of other leading brands.

Strawberries—Field Culture.

Nitrogenous Manures on Strawberries—"Fruit Soft and Inferior in Flavor."

Few fruit-growers are better known to the agricultural press or among practical nurserymen than Messrs. G. H. and J. H. Hale (Elm Fruit Farm), South Glastonbury, Conn. In their Fruit Farm Catalogue, under the head of "*Strawberries*," they state:

"The three things necessary to produce a perfect crop of fine large strawberries are manures, moisture, and thorough cultivation, and it is almost impossible to get too much of either provided they are *judiciously applied*. Almost any soil that will produce good crops of corn, and is well drained, either naturally or artificially, will give abundant returns if the above requirements are complied with. Well-rotted stable manure is a good fertilizer, but in the cultivation of our large fields we have been obliged to experiment with commercial fertilizers, and have become convinced that stable manure or *nitrogenous* commercial fertilizers are taken up greedily by the plants, and too rank a foliage is obtained, and the fruit is soft and of inferior flavor."

[Extract from "SMALL FRUIT CATALOGUE," issued by G. H. and J. H. Hale, South Glastonbury, Conn.]

"Big Berries and Lots of Them."

"Whether we are growing them for family use or for market, the question is, *how* can we have them? and from years of experience, while we know that oftentimes satisfactory and paying crops can be grown under almost any system of culture and on any soil, yet to have 'big berries and lots of them,' we must give up our old and slipshod methods of culture, and give only the best and most thorough care from beginning to end. This does not necessarily mean being at any great expense, either in cash or extra labor; *it simply means doing the very best we can with the means at our disposal.*

"Good Corn or Wheat land (which can be found on any farm), plowed deep and followed by a subsoil plow, if possible, are the first essentials. A *liberal* manuring on *the surface after plowing*, with raw ground bone and wood ashes, if they are to be had, and if not, muriate of potash; from 400 to 600 pounds of potash, and from 1,200 to 2,000 pounds of bone per acre, the quantity depending somewhat upon the natural fertility of the soil. This is rather more slow in its effects than the **Mapes Fruit and Vine Manure**, which is the best of any of the ready mixed special manures we have ever tested. From 1,200 to 1,500 pounds of this, or the bone and potash, we have found to give better results than stable manure, although well-rotted manure may be used to good advantage. Whatever manure is used it should be *thoroughly harrowed in*, to prepare the grounds for planting, which should be done in early Fall or *very early* Spring. *Planting only the most approved varieties, young, thrifty, well-rooted plants*, propagated with care from **Pedigree Stock** (never using plants from old and worn-out fruiting beds); **good clean culture at all times**, remembering that it is much cheaper and easier to hoe a field *three times a month than it is once.*

"Mulching of some sort to give Winter protection and keep ground moist and fruit clean in Summer, and irrigation if possible. The foregoing general rules, only fairly well carried out, will, in most cases, give 'big berries and lots of them,' at a less cost than a small amount of inferior fruit can be grown for under a less thorough system of culture."

NOTE—Messrs. Hale formerly used and recommended fine raw bone and unleached wood-ashes (or Muriate of Potash); afterward they preferred fine raw bone, treated with Sulphuric Acid and mixed with high grade Potash Salts. They now recommend the **Mapes Complete Manures prepared for fruits.**

A Big Strawberry Crop.

Mr. David Kuehn, owner of the Highland Truck Farm, near Allentown, Pa., according to the *Democrat* of that place, last season picked and marketed 12,070 boxes of strawberries from one and one-eighth acres of land. The berries were all of prime quality and good size, or, as the *Democrat* puts it, "the largest and best to be had." The picking season commenced June 1st, and lasted six weeks. Mr. Kuehn gives the whole credit to the use of the Mapes "Complete Manures," amount not specified. Of course such a crop could only be produced by careful cultivation according to the most approved methods of successful growers, but the credit is doubtless largely due to feeding the plants in the most liberal manner with fertilizers specially adapted to promoting productiveness, large size and high quality. It is now a well-recognized fact that the character of the food supplied has a marked effect upon the products of plants, as well as of animals.

The Mapes Orange Tree Manure.

GUARANTEED ANALYSIS.

Ammonia, 4 to 5 per cent.; Phosphoric Acid, 9 to 11 per cent. (soluble and available, 6 to 8 per cent.); Soluble Potash, actual, 3 to 4 per cent., all as high grade Sulphate and in forms free from Murates (or Chlorides); Magnesia, Soda, Lime, etc., 80 to 84 per cent.

For use particularly on YOUNG Trees of all kinds, Grape Vines, Nursery Stock, Small Fruits, Raspberries, Currants, Strawberry Beds, Spring and Fall. It is safe for use around young trees or the youngest nursery stock, and will promote good wood-growth and insure vigor without deterioration of fruiting quality.

On bearing fruit trees of all kinds, strawberry beds and small fruits, this manure may be used to good advantage in connection with the FRUIT AND VINE MANURE.

DIRECTIONS FOR USE.

Scatter broadcast around the tree as evenly as possible, commencing two or three feet from the trunk and extending out and from the tree to a distance equal to about its height or as far as the lateral roots may extend. Work the fertilizer lightly into the ground as soon after application as convenient. In setting out young trees from the nursery, a small quantity, say half a pound per tree, may be used, if thoroughly mixed through the soil where the ends of the roots are laid. A good plan is to mix the fertilizer with equal bulk or more of soil before application; this will secure more even distribution. After the tree is planted, another half pound should be scattered on the surface around each tree, in a ring say three feet wide and one to two feet from the trunk.

Use three to ten bags per acre broadcast.

For full directions for use of the Mapes Orange Tree Manure and Fruit and Vine Manure on Orange Groves, young and old, see our Florida Pamphlet.

The Mapes Pamphlet for Florida and on Fruit Growing.

MR. CHARLES V. MAPES was the first to lay stress upon the importance in fruit culture of using manures especially adapted to promoting fruiting power, in contradistinction to wood-growth. He insisted that the essential elements of plant-food should be supplied not only in varied forms, so as to insure the greatest certainty of action possible in meeting the demands of the trees or vines at their successive stages of growth and ever-changing conditions, but also that there should be present those forms that have been found by practical experience and scientific research to be the best adapted for promoting the highest quality of fruit as well as quantity. He claims that merely to make a fruit tree or grape-vine grow vigorously was a very small part of real success; that rapid wood-growth was often made at the expense of both quantity and quality of fruit, together with impaired stamina and disease-resisting strength of the trees and vines, thereby causing them to fall an easy prey to attacks and strains put upon them by adverse seasons, fungi, insects, etc. This injurious forcing manuring he claimed to be especially injurious to the orange and grape (for vine or market), and but little less so to apples, peaches, pears, strawberries, etc. So far as we can learn and can gather from the pamphlet, the reports of practical fruit and orange growers who have used the Mapes Fruit Manures fully verify the correctness of Mr. Mapes' views. Orange groves that gave promise, under the usual stimulating manuring, of good yields have been found to have succumbed to the frost, scale insects, fungi, etc.; while those that were manured with the Mapes Manures have "weathered the storm," as it were, and have brought their owners large returns in abundant crops and high prices. These groves that have turned out so well have in many cases been grown exclusively with the Mapes Manures (no farm manure used) since setting out, and on the lightest sandy poor lands.—*Rural New Yorker*.

Oats.

It is not the *quantity* of plant food consumed by the Oat crop that causes it to rank as one "taking the heart out of the soil," but rather its demands for soluble and easily assimilated forms of food. It is a *surface feeder* and a dainty one, and differs radically from Corn. For this reason the crop following Oats has generally, under old methods, been a sufferer. Apart from available plant food, the right kind of season, as every farmer knows full well, is a necessity for a large Oat crop. With the Mapes Manure the yield has frequently reached eighty bushels per acre. Formerly the Oat crop received little or no Fertilizer, but during the last ten years our customers have found that their crop pays best when fairly well fed with high grade soluble fertilizers.

We have four manures that are adapted for Oats under varied conditions. Use as follows :

COMPLETE MANURE FOR LIGHT SOILS: For light, sandy soils. If in drill use 100 or 200 lbs. per acre. If broadcast, 200 to 400 lbs. We recommend the broadcasting, particularly for seeding with grass, when 200 lbs. additional should be used.

COMPLETE MANURE FOR HEAVY SOILS: For clay, heavy clay loam, shale, slate, or any soil well supplied with potash, naturally, or from previous dressing with wood ashes. Use the same quantity and in same way as described above.

COMPLETE MANURE FOR GENERAL USE: For all average soils. Use as above described, increasing the quantity according to poverty of the soil.

COMPLETE MANURE "A" BRAND: For use *alone* on fairly good land or *with stable manure* on poor land. Use same quantities as above.

The quantities of fertilizer recommended for the Oat crop may appear to be very small, particularly as compared with those in use for other crops, notably Potatoes, where 1,500 to 3,000 lbs. per acre are profitably used. In the case of the Oat crop there is danger in some sections of producing "swamping" or lodging unless the fertilizer is applied in any but very moderate quantities, particularly if the fertilizer has been drilled.

Lessons of the Prize Oat Crop Contest.

REMARKABLE YIELDS OF OATS—83 BUSHELS ON ONE ACRE—ALSO OVER 133 BUSHELS ON ONE ACRE.

[From the *American Agriculturist*, Editorial, January, 1890.]

The experience of Riley T. Scott (over eighty-three bushels) with fertilizers on a piece of comparatively new land in La Fayette Co., Wis., will lead many Western farmers to try the experiment on similar soils. In this instance the timber had been cut in 1856, but the land lay wild until '86, when it was cleared and planted to sod corn, which, with the next crop, was cut for fodder; a good crop of corn (grain) being taken off in '88. This land, which was a total stranger to manure or fertilizer, had 400 lbs. of Mapes Complete Manure for Heavy Soils (ammonia, six to seven per cent.; phosphoric acid, ten to twelve per cent.; potash, three to four per cent.) sown upon it evenly by hand, and most thoroughly harrowed and worked into the soil.

Another good crop, the report of which came in too late to be included in the prize award, was grown by Alfred Rose, Yates Co., N. Y. The White Wonder and White Bonanza varieties were grown, and the yield claimed is 4,280 lbs., equivalent to 133 bushels, 24 lbs. by weight. The White Bonanza weighed 45 lbs. to the bushel, and the White Wonder 52 lbs., and both varieties were pronounced earlier than the Welcome oat. This crop was grown on a well-prepared soil fed with 800 lbs. per acre of Mapes Oat Manure.

Asparagus.

For ASPARAGUS use the Potato Manure or the Vegetable Manure, with or without stable manure.

For RENOVATING OLD BEDS apply in early Spring or in the Fall, broadcast or over the rows, distributing well and working the fertilizer in; three to four bags per acre.

For NEW BEDS the quantity of fertilizer may be increased to from five to ten bags per acre, broadcast evenly over the rows or over the entire surface of the bed. (Send for Special Circular on Asparagus Growing—no charge.)

[From the *American Garden*.]

How Fine Asparagus is Grown for the New York Market at a Handsome Profit.

BY VALENTINE FROST, OYSTER BAY, L. I.

In planting a new bed of Asparagus, the first and most requisite thing is the selection of suitable soil, which should be a light sandy loam, or clear sand without stones or gravel; although fair crops may be produced in almost any clean land. Seed should be carefully selected from the largest and most productive roots and planted as early in the Spring as possible, in heavily manured, clean land (kept free from weeds), in drills about one foot apart, eight or ten seeds to the foot.

Transplant the next Spring to land previously made rich; after potatoes is the best. Trench out the rows about four feet apart and about ten inches deep; for this purpose I use a large-sized Syracuse plow, with an extra mould-board of wood made fast on the top of the iron one, and go four times in a row, across and return; then attach a chain about six feet long, and go back and return again. This usually will make the trenches deep enough. Place the one-year-old selected roots twenty inches apart in the bottom of the trenches. Cover them lightly, and then apply a good coat of well-rotted stable manure, about fifteen two-horse wagon loads per acre, and cover it lightly again. When the young plants are up and weeds begin to grow, run a cultivator on the ridges and throw in a little soil, being careful not to completely cover the young plants.

It may be required to follow with a hand hoe and gradually fill the trenches to a level as the young plants grow. Always keep the ground clean of weeds. The next Spring plow off the soil lightly from the top of the roots, and so let the bed remain until the shoots are well up. Then return the earth and make a ridge about the same as for potatoes. Later, go over the piece with a fine-toothed harrow. If the young plants come quite strong they may be cut a second time the first season and stop about June 1st, and then let them grow, and get the whole bed clean of weeds. Every alternate year apply manure and turn it under as deep as you can plow without touching any of the roots. At any time during the Winter when the ground is frozen or thawed a little and the tops are dry, we cut off, with a hand hoe, all of the old tops, which are then gathered into heaps with a spring-tooth horse rake and burn upon the Asparagus ground.

Mr. Frost on the Mapes Manures.

MR. FROST writes:

My experience with the Mapes Manure on Asparagus since 1875 steadily won me over to believe that it was much cheaper, not only in the first cost, but it made a very large saving in labor of application and care of crop, and, more than all, it produced one-third larger yield than stable manure, and at less than one-half the cost, besides producing finer quality and bringing in a good deal more money for the crop.

I have added only six acres to my original bed of ten acres. In 1884 I set out four acres, using nothing but the Mapes Complete Manure, no stable manure. I was led to do this by my experience in setting out two acres the year previous, using the Mapes to the exclusion of stable manure. The results were so good and produced at such a large saving that I determined to use nothing but the Mapes, so as to save labor and expense, and also to avoid the weed seed of the stable manure.

We cut the two-acre piece the following year, 1884. We cut from the whole six acres, season 1886, and it was the finest of all the Asparagus I had from my sixteen acres.

I expect to set out twenty acres more of Asparagus, and use nothing but the Mapes Complete Manure.

The Mapes Cabbage and Cauliflower Manure.*

GUARANTEED ANALYSIS.

Ammonia, 5 to 6 per cent. ; Phosphoric Acid, 6 to 8 per cent. (soluble or available, 6 per cent.); Soluble Potash, actual, 6 to 8 per cent.

DIRECTIONS FOR USE.

CABBAGE, LATE.—Apply broadcast and in the hill or drill. Spread broadcast four to eight bags per acre, after plowing and harrow in. Apply two to four bags, scattering well, in the hills. No stable manure necessary.

CAULIFLOWER.—Apply the same as for cabbage.

EARLY CABBAGES.—Apply *broadcast* (eight to ten bags per acre). At setting apply *in the hill*, scattering well, 200 lbs. per acre. For promoting **EARLY** maturity and *maximum size*, frequent additional applications around the plants (extending the circle each time) may be made. It is surprising to see the effect of these *after-applications* (of only a few hundred pounds). As growers have said, "they could almost see the cabbage grow."

SUPERIOR QUALITY.—The Cauliflowers are larger, more even in size, firmer and superior in whiteness and perfection of quality than when grown in the old way. The same may be said of Cabbages as the result of many years' experience among the largest and best known truckers in New Jersey, Pennsylvania, Connecticut and Long Island. Most of these growers have used this manure, *to the entire exclusion of stable manure*, for many years.

An Authority on Trucking.—Experience with the Mapes Vegetable Manure, Season 1889.

THEO. F. BAKER, Bridgeton, N. J., reports Oct. 16th, 1889:

It is with pleasure I report on the use and application of your Vegetable Manure. During the season just passed I used it in comparison with other good fertilizers, but more especially against one brand having an analysis of 6 per cent. Ammonia, 10 per cent. Phosphoric Acid, and 5 per cent. Potash. Also used it in combination with stable manure and alone. Applied from 500 lbs. to 2,000 lbs. per acre, according to the requirements of the crop to be grown, on the following crops: beets, radishes, early cabbage, early tomatoes, peppers, celery and late potatoes.

While we have had a continued wet season, and all forms of manures and fertilizers have had a most favorable opportunity to do their best, the Mapes Vegetable Manure stands at the head, and showed by its marked effects on all crops treated to an application, to be the most profitable, producing earlier and more abundant yields, more thrifty and less diseased plants, especially so with early tomatoes, peppers, early cabbages and potatoes.

MR. BAKER adds in a note to MR. CHARLES V. MAPES: I am more than pleased with the results from your Vegetable Manure, and I feel that you have done and are still doing more than any other one man in the country in assisting farmers and gardeners to produce big crops and "make two blades of grass to grow where but one grew before."

[From the *American Garden*, January, 1890.]

Fine Cauliflowers.

A sample cauliflower received by the Editor in November, grown by R. G. Overton, at Southold, on the Mapes Manures exclusively, was certainly the finest we ever tasted. The specimen was of the largest size, a solid mass of beautiful white, free from any suspicion of irregularity. When cooked and served in the usual way it was found to be delicately tender and deliciously flavored, not a tough fibre in the head. These growers are only two among many gardeners who continuously employ chemical manures in raising vegetables of the first quality, which therefore command the highest market prices. Secretary Baker, of New Jersey, lays great stress on the extra quality of radishes, beets, carrots, and all other vegetables grown on fertilizers, and the prices he obtains for his products are the envy of many less progressive gardeners.

* NOTE.—This manure was originally prepared for the growers of Cabbages and Cauliflowers at Mattituck, Southold and Jamaica, Long Island. Its remarkable and continued success for some fifteen years has led us to adopt this formula for *all sections*.

The Mapes Complete Manure for Heavy Soils.

GUARANTEED ANALYSIS.

Ammonia, 6 to 7 per cent.; Phosphoric Acid, 10 to 12 per cent. (soluble and available, 8 to 10 per cent.); Potash, 3 to 4 per cent., all as high grade Sulphate and in forms free from Murates (or Chlorides); Magnesia, Soda, Lime, etc., 77 to 81 per cent.

This Manure is an excellent substitute for No. 1 Peruvian Guano, and may be used in the same way *on all crops* as Peruvian Guano. The Ammonia is "fixed" with acid, so that none escapes during exposure. Adapted for use on *any soil and for any crop* where LARGE PROPORTIONS of Ammonia and Phosphoric Acid, together with small and moderate quantities of Potash, are desired.

In localities where supplies of Potash are cheaply obtained, in Sugar Cane "Bagasse," Cotton Seed, Hull Ashes, Wood Ashes, etc., this fertilizer will supply the necessary Ammonia and Phosphoric Acid to make the highest grade complete manure for Fruits, Sugar Cane, Tobacco, Early Vegetables, Truck, on even the lightest soils. Do not mix the fertilizer with the "Bagasse" or Ashes, but apply them separately on the land.

DIRECTIONS FOR USE.—May be drilled in with the seed, with wheat, rye and other grain crops, or sown broadcast, as preferred. The potash in this manure is not sufficient to injure the grain or grass seeds or young roots. With more tender plants, should be mixed with the earth or scattered.

May be used as a top-dressing at any time for grass lands—Spring, Early Summer or Fall.

FOR HOED CROPS.—May be sown broadcast before harrowing, also at planting in and around the hills or rows, covering and scattering well, and at any subsequent hoeing around and between the rows.

FOR STRAWBERRIES.—This Manure is particularly well adapted on all soils as a Top-Dressing for Beds, where contact with the vines is unavoidable. Use two to three bags per acre.

May be used also for Oats (one to two bags), Wheat, Grass (two to three bags), Seeding or for Spring Top-Dressing of Meadows, Pastures, etc., particularly on Clay Lands; also Barley, Rye and Nursery Stock. Safe for use in grain drill with Grain or Grass Seed up to 300 lbs. per acre; above that amount, broadcast, or in grain drill *without seed*.

IN FRUIT CULTURE (Grapes, Strawberries, Currants, Raspberries, Blackberries, etc.), particularly where the land is strengthened in potash by the use of wood ashes or by the use of the MAPES FRUIT AND VINE MANURE, this COMPLETE MANURE FOR HEAVY SOILS is excellent around young or old Grape-Vines or Fruit Trees, Pears, Plums, Apples, Quinces, etc., and will promote *vigorous growth* of wood without impairing, but, on the contrary, improving the fruiting, both in quantity and quality.

Excellent for Nursery Stock of all kinds. USE THREE TO FIVE BAGS per acre.

The Mapes Tobacco Starter.

Ammonia, 3 to 4 per cent.; Phosphoric Acid, 12 to 16 per cent. (available, 8 to 10 per cent.); Soluble Potash, actual, 2.50 to 3.50 per cent., all as high grade Sulphate and in forms free from Murates (or Chlorides).

FOR TOBACCO BEDS, also for PLANTS at SETTING OUT.

A Manure specially prepared from the choicest forms of plant food, perfectly blended and proportioned for use on Tobacco Beds for securing EARLY and VIGOROUS plants. Also for use in the drills at setting of the plants, to insure (on all soils) the *early maturity* of the tobacco crop, so necessary particularly in the Havana varieties.

DIRECTIONS FOR USE.—On seed beds apply 12 to 15 lbs. to the square rod. Work in with a spade, or harrow a week or so before sowing the seed. Work the bed over again, fine it down, and sow the seed. If dry seed instead of sprouted is sown, one or two pounds more of the starter can be used with safety.

On light lands, in drills, use 400 to 600 lbs. per acre. On heavier soils, 600 to 800 lbs. per acre.

A good plan, perhaps the best, is to sow broadcast over the drill, and ridge back lightly, leaving the ridge low.

The use of this "Starter," in connection with the Mapes Tobacco Manure (Wrapper Brand), or with stable manure, home compost, etc., tends to promote not only *early vigorous growth*, but *early maturity of crop*.

SEND FOR TOBACCO PAMPHLET.

The Mapes Tobacco Manure (Wrapper Brand).

GUARANTEED ANALYSIS.

Ammonia, 7.50 per cent.; Phosphoric Acid, 4.50 per cent.; Soluble Potash, actual, 10.50 per cent., all as high grade Sulphate and in forms free from Murates (or Chlorides).

For growing SUPERIOR QUALITY of leaf, particularly for wrappers.

This is our new Manure for Tobacco, and is prepared to meet the special demands of many large growers who make tobacco a *specialty* and grow it almost to the *exclusion of other crops*, and who desire a manure complete in itself for all the demands of the *finest quality* of the *crop* and at the same time containing the elements in the most *economical proportions* to meet the wants of the current crop.

The available Ammonia, Phosphoric Acid and Potash (to say nothing of Lime, Magnesia, and other ingredients) are equal, in one ton of this manure, to that contained in 30 to 50 tons of well-rotted stable manure; the quality of stable manure necessarily varying greatly with the feeding and grade of the animals.

We mention this comparison so that the relative strength in plant-food, available to the crop, may be the better realized; but, as all tobacco growers know, the *mere strength* in fertilizing ingredients is by no means the measure of success in growing Tobacco, or in meeting the capricious demands of the public and manufacturers. The adaptation of peculiar forms of Ammonia, Phosphoric Acid and Potash, as well as of Lime, Magnesia, Organic Acids, and Vegetable Acid Substances, is of even greater importance.

We believe we have found a combination of such forms of plant-food as will insure good fragrance, the finest closest grained, high-finished leaf, with the glossy lustre (so highly prized for segars) and qualities possessed by the famous Sumatra.

The greatest care is used in the selection of the raw material in the preparation of this Manure, particularly of Peruvian Guano, Potash, Nitrates, Ammonia and Organic Nitrogen.

It is free from disagreeable odor, unexcelled in mechanical condition, fineness, dryness, and thoroughness of manipulation. Every pound available as plant-food. No make-weights.

No Sulphuric Acid or any other acid is used in the preparation of this manure; ALL THE PHOSPHORIC ACID is from Pure No. 1 Peruvian Guano and Pure Fine Bone. The Nitrogen and Ammonia used are present in many varied forms especially adapted for Tobacco.

"The highest grade Tobacco Manure on the market."—(New England Homestead.)

This manure is *fifty per cent.* stronger than most other Tobacco Fertilizers.

HOW MUCH TO USE ; HOW TO APPLY, ETC.

2,000 lbs. per acre alone, without anything else, is good manuring.

USED ALONE.—Sow one-half ton or more per acre before plowing, then plow under lightly (half depth). In two to four weeks plow the land at *full depth* and sow on the balance, thoroughly cutting in with long-toothed wheel, or any of the improved harrows. This will leave the land, so far as manuring goes, ready for fitting in the usual way before setting plants.

WITH ONE-HALF STABLE MANURE.—If one-half quantity stable manure is used, then sow one-half ton per acre of the Mapes Tobacco Manure, Wrapper Brand, on at last harrowing, working it in the land thoroughly. Then fit the land for setting, as usual.

WITH THREE-FOURTHS STABLE MANURE.—If three-fourths quantity of stable manure is used, apply 500 to 600 lbs. per acre of the Mapes Tobacco Manure, Wrapper Brand, and harrow in at last harrowing, and fit the land in usual way.

ON SOD LAND.—When the Mapes Tobacco Manure, Wrapper Brand, is used alone on Sod Land apply 2,000 lbs. per acre of the Mapes after plowing, and thoroughly cut in with wheel, disk, or long-toothed harrow *as long as possible before the time* of fitting the land. Then harrow again, and fit land for setting in ordinary way.

(See Special Pamphlet on Tobacco Growing and use of the Mapes Wrapper Brand. Mailed Free.)

Complete Manure for General Use.

GUARANTEED ANALYSIS.

Ammonia, 4 to 5 per cent. ; Phosphoric Acid, 10 to 12 per cent. (soluble and available, 8 to 10 per cent.); Soluble Potash, actual, 4 to 5 per cent.

This is a substitute, on average good soils, for farm manure. For use on all crops and all soils, with or without stable or farm manure. This Manure is stronger in Ammonia and Potash than the "A" Brand, and corresponds more closely in composition to that of stable manure, only in a highly concentrated form—thirty- to forty-fold stronger in immediate soluble plant-food as compared with average farm manure.

DIRECTIONS FOR USE.

USE BROADCAST. If any in hills use sparingly or scatter well; 2 to 4 bags per acre.

On poor land, double these quantities may be used with profit. There is no danger of waste by leaching or evaporation of the portion that is not reached by the crop to which it is applied, except with the ammonia, and with this to only a limited extent.

For use on general farm crops, also on Vegetables, Hungarian Grass, Millet, Buckwheat, Wheat, Rye, Hops, Barley, Mangolds, and for all Grain Crops and Seeding to Grass, with or without grain.

Also for Oats, Tomatoes, Melons. (See Index, for these crops, as there are special directions under the head of each.)

FOR WHEAT ALONE.

On average good wheat land use one and one-half bags per acre.

FOR WHEAT AND SEEDING TO GRASS.

On average good land use two to three bags per acre, drilled in with the seed.

If sown broadcast, the above quantities should be increased by one bag to insure as thorough distribution in the soil as when drilled.

On poor land, particularly when seeding to grass, these quantities may be increased.

APPLICATIONS BOTH BROADCAST AND WITH THE DRILL.

Many of the most successful farmers, who look for permanent effects on grass, make a broadcast dressing of the fertilizer *after plowing and before harrowing* of one to three bags per acre, and then drill in the usual quantities with the grain in the drill.

FOR BARLEY, RYE, OATS, BUCKWHEAT, ETC.

Use same as for wheat and seeding, only in smaller quantities.

FOR TOP-DRESSING GRASS LANDS (MOWING AND PASTURE) AND FALL SOWN GRAIN.

For grass land and grain, scatter evenly broadcast in *early Spring*. If the land is LEVEL, a good plan is to scatter on the snow, and the melting of the snow will carry the fertilizer into the soil.

A broadcast dressing may be made at any stage of growth, only the earlier it is done the more benefit will be derived from the Spring rains. Midsummer and Fall applications will be found beneficial on all grass lands after cutting.

FOR USE WITH STABLE OR FARM MANURE.

This Complete Manure adds greatly to the strength of stable manure. It largely increases its supplies of soluble plant-food elements and corrects its deficiency in soluble Phosphoric Acid.

In using a Kemp Manure Spreader, some farmers dump a bag of the fertilizer evenly over the top of the manure in the cart, and then spread the two out together. This saves labor of extra handling, and distributes the fertilizer admirably. Again, the farm manure can be spread alone broadcast, and the fertilizer used alone in the drill.

NO ILL EFFECTS FROM LONG-CONTINUED USE.

There need be no fear of even the constant exclusive use of this fertilizer, tending to harden the soil or make it less retentive of moisture. Experience has shown that even the long-continued use of these complete fertilizers, particularly with ordinary rotations of crops, supply, through the decay of the roots and stubble of the crops grown, *amply sufficient vegetable matter to keep up the supply of humus.*

“A Good Wheat Crop, but Poor Grass, and Little Permanent Improvement to the Land.”

This heading expresses the conclusion often reached by intelligent farmers who try to grow grain and grass and improve their farms by using only superphosphates. Some years they get good crops of wheat, even with acid phosphate or some cheap superphosphate. They feel encouraged, particularly as they have, perhaps, used only 200 lbs. per acre, drilled in with the wheat. They may get even two wheat crops in succession—wheat after wheat—by this means, but their disappointment comes with the poor grass outlook. Many farmers have complained that, although their wheat crops are made better by using a bag to the acre of a plain or cheap ammoniated superphosphate, *their grass was not as good as in former years*, when they used nothing but the limited quantity of farm manure produced on the farm. The failures on wheat with superphosphates are very frequent. It is only by studying the results from superphosphates when used continuously for a long series of years that the fact can be brought out plainly that superphosphates, acid phosphates, or other low-grade, cheap fertilizer, *cannot be made* to take the place of farm manure. Some of these substitutes are called “Complete Manures,” and in a certain technical sense they may be complete to the extent of containing a small quantity of potash and ammonia, in addition to phosphoric acid; yet they are not in any practical sense adapted to improve the land, or increase its stock of fertility, like farm manure or a good high-grade complete manure.

TEMPORARY BENEFIT FROM LOW-GRADE FERTILIZERS.

These low-grade substitutes, like acid phosphates and superphosphates, may often, when applied in the drill, show a marked increase in the yield of the wheat. This result is due generally to two causes—first, the wheat is given a better start before Winter; second, the fertilizer acts as a solvent, and renders available to the plant the resources of previous manurings or the plant resources of the soil itself. This action might be a satisfactory one if the soil were a strong one, but all the time the soil is becoming poorer by EXHAUSTION OF ALL THE PLANT-FOOD INGREDIENTS, which the fertilizer fails to supply from its own resources. The soil stands the drain for the wheat but is unable to continue to respond to this solvent or dissolving action of the fertilizer, and, in consequence, the grass fails and the land is in no way improved, but, on the contrary, is worse than before.

During the forty years' experience of Dr. J. B. Lawes, at Rothamsted, England, in wheat-growing with superphosphates, complete manure and farm manure, used separately, the superphosphates failed to produce on the average for the whole time more than ONE BUSHEL PER ACRE per year increase; and on grass, the superphosphates did not increase the yield for the forty years more than about a hundredweight per acre increase annually. At times the yield of wheat and grass was increased; but the effect was temporary and uncertain. On the other hand, where the wheat and grass were fertilized with a complete manure, THE YIELD FOR THE ENTIRE FORTY YEARS WAS LARGELY INCREASED OVER THAT OF THE NATURAL SOIL, AND WAS FULLY AS LARGE AS FROM YEARLY DRESSINGS OF 15 TONS PER ACRE OF THE BEST FARM MANURE.

The uncertain and apparently contradictory results from superphosphates, acid phosphates, etc., are explained by the experience of Dr. Lawes. Even the strong land needs COMPLETE MANURING.

The Mapes "A" Brand Manure.

GUARANTEED ANALYSIS.

Ammonia, 3 to 4 per cent. ; Phosphoric Acid, 12 to 16 per cent. (soluble and available, 10 to 12 per cent.); Soluble Potash, actual, 2.50 to 3.50 per cent. ; Lime, Magnesia, Soda, etc., 78 to 82 per cent.

Specially adapted for use *in hill or rows* on ALL CROPS, with Farm Manure, or one of the Mapes Special Crop Manures, broadcast.

The DRILLING QUALITY of this manure, and its effect on Wheat, Rye, and succeeding Grass Crops, have achieved for it, after many years' use, a very high reputation.

DIRECTIONS FOR USE.

May be applied at planting by hand or machine, in the drill, hill or row, or sown broadcast, or *at any* hoeing or disturbance of the soil, working in. Use two to four bags per acre on average good land.

For Spring Use is admirably adapted for use in the hills, rows or broadcast, for Corn, Potatoes, Rye, Buckwheat, Oats, Early Vegetables, Cotton, *and general crops*. It is specially adapted for growing Peas, Beans and Turnips.

For Fall Use is specially adapted for use *in the drill* for Wheat, Rye and Seeding Down to Grass on naturally good wheat lands, or such as—like the shale, slate or clay loam soils—are apt to be well supplied with potash.

The Mapes Nitrogenized Superphosphate.

GUARANTEED ANALYSIS.

Ammonia, 2.50 to 3 per cent. ; Phosphoric Acid, 11 to 13 per cent. (soluble and available, 9 to 11 per cent.); Soluble Potash, actual, 2.50 to 3 per cent. ; Magnesia, Lime, etc., 80 to 84 per cent.

Unsurpassed for drilling, or for use in the hill or drill on all farm crops. One to three bags per acre.

Ammoniated Dissolved Bone (with Potash).

GUARANTEED ANALYSIS.

Ammonia, 1.50 to 2 per cent. ; Phosphoric Acid, 12 to 14 per cent. (soluble and available, 10 to 12 per cent.); Soluble Potash, actual, 1.50 to 2 per cent.

This fertilizer is fine and dry, in excellent mechanical condition, and well adapted for use in hill or drill, or for mixing with composts or home-made manures.

Use the same as any Superphosphate. One to three bags per acre.

Grass.—Seeding Without Grain.

FOR SPRING OR FALL SEEDING WITHOUT GRAIN.

Use on Average Soils the "Complete Manure for General Use." Apply, after plowing, two or three bags broadcast, or, if preferred, in seed drill. If *in seed drill with seed*, use not over 300 pounds, balance separately.

On Very Light Soil use the "Complete Manure for Light Soils." Apply broadcast two to three bags per acre. If applied *in seed drill with seed*, do not use over 200 pounds per acre, balance separately.

The Corn Manure is also an excellent manure broadcast for same purposes as the two preceding manures.

The above manures may be used alone, or, if preferred, *with* stable or farm manure. On poor lands, or where it is desired to lay the foundation for *permanent* pastures or mowing fields, *double the above-named* quantities may be applied broadcast.

Either one of the above manures is adapted for FULL FEEDING OF ALL THE GRASSES, and for insuring the richest nutritive quality for feeding, luxuriant growth, large yield and *permanent improvement of the land*, the same as results from stable manure even when supplemented with bone and hard wood ashes.

For top-dressing grass lands of all kinds, effects of different manures on grass lands, etc., see Mapes Grass Top-Dressing.

The readers of the Mapes Pamphlets will doubtless recall many cases where very poor lands have been brought up into good condition, equal to the best on the farm, and made to pay well in grass and general crops, by the use of the Mapes Manures alone.

Tomatoes.

ON HEAVY OR ON AVERAGE SOILS use the Complete Manure for General Use.

For early Tomatoes: in the hills, scattering well, 400 to 600 lbs. per acre.

For Fall or late crops, for canning, etc., to produce largest yield apply 600 to 800 lbs. per acre, mostly broadcast, using say one-third *in the hills* at setting.

ON VERY LIGHT SOILS: Use the Vegetable Manure, or the Mapes Potato Manure, same way and in same or larger quantities than above.

No. 1 Peruvian Guano—Genuine, Raw and Unmanipulated.

Direct from Deposits in Peru. Free from Adulteration or Admixture.

This Guano is imported by us in bulk, direct from the deposits in Peru, and put up in new strong bags when unloading, without any manipulation, and therefore free from all adulteration or admixture.

We are prepared to supply this No. 1 Peruvian Guano in any quantity desired, either to buyer's vessel at South Brooklyn Public Stores, or free on board cars or boat at New York, in any quantity, from one bag upward.

Sold on *actual weights at time of delivering* from Public Stores (at South Brooklyn). Weights will be marked on bags when desired.

Prices, cargo analyses, etc., given on application. Address, The Mapes Formula and Peruvian Guano Co., 143 Liberty Street, New York.

Ground Bone—Pure.

PURE GROUND BONE, Fine (Mapes Brand).

This is the only grade of ground bone we are now manufacturing. In mechanical condition it is somewhat finer than the grade formerly sold by us under the name of "Fine."

The above grade consists of ABSOLUTELY PURE Bone, reduced by improved machinery to fine condition, without admixture or treatment with any dryer, salt or nitre cake, plaster, natural phosphate or adulterant. IT IS ABSOLUTELY PURE.

PURE BONE MEAL.

GROUND BONE, FOR CHICKENS.

The Mapes Economical Manure.

GUARANTEED ANALYSIS.

Ammonia, 3 to 4 per cent. ; Phosphoric Acid, 8 to 10 per cent. (soluble and available, 6 to 8 per cent.); Soluble Potash, actual, 8 to 10 per cent. ;
Magnesia, Lime, Soda, etc., 76 to 80 per cent.

For POTATOES, CORN and GENERAL CROPS, or any purpose where a COMPLETE MANURE is required—one very rich in potash (soluble). The potash is in the form of Sulphate and Muriate. It is not “forcing,” but contains all the elements essential in producing seed and tuber development—early ripening and permanent improvement to the soil—particularly for grass.

DIRECTIONS FOR USE.

The large quantity of potash in this manure makes it *unsafe* FOR USE IN THE HILL or drill unless it is well scattered and mixed with the soil. It must not come in direct contact with the seed, and should not be used in the grain drill with seed of any kind.

For Potatoes, may be used in hill or drill if well scattered and mixed with the soil—or applied scattering well *after* the seed pieces are covered.

This manure is especially well adapted to fruit culture, where the presence of Muriate of Potash is unobjectionable, as with Peach, Apple and Pear orchards.

DIRECTIONS FOR USE ON PEACH ORCHARDS, ETC.

Scatter broadcast and around the trees, beginning in a circle about one foot from the trunk and extending as far or further than the end of the branches. The further from the tree the fertilizer extends, the further the roots will develop. The more thoroughly the fertilizer is worked in by harrowing or otherwise, without injury to the roots, the sooner the fertilizer will become effective, and also the more evenly it will be distributed through the soil.

The quantity to be applied depends upon the condition of soil, age and condition of tree. With very young trees a single bag per acre will suffice. For bearing trees, say two to three bags per acre, or three to four pounds per tree. If soil be very poor, and tree in bad condition, this quantity may be doubled. However large the quantity applied on the surface soil, the fertilizer will come in contact with the roots very gradually, and the effects will necessarily be slow. It is not a stimulating manure, and is intended especially for *improving in fruiting power* as well as in securing HEALTHY VIGOR to the tree and ability to withstand attacks of disease, fungi, etc.

Pure Fine Bone,

DISSOLVED IN SULPHURIC ACID.

GUARANTEED ANALYSIS.

Ammonia, 2.50 to 3 per cent. ; Phosphoric Acid (soluble and available), 12 to 16 per cent.

This bone is treated with sulphuric acid only in sufficient quantity to break it down finely and make it quickly acting. It is the highest grade and purest preparation of dissolved raw bone made. Admirably adapted for Cabbage seed, Greenhouses, Flowers, etc. Perfectly safe for use around all young plants. An improvement on the *finest* bone meal for all plants. Excellent for preparation of home-mixed fertilizers, improvement of composts, etc., etc.

SOME LEADING AUTHORITIES ON THE MAPES MANURES.

"The Mapes fertilizers, though higher in price than some others, are scientifically, carefully and honestly made. In the use of them we are always pretty sure of good results. We use them every year and have not been disappointed in their action. They seem to go right to the spot and stay there better than any other sort we have used. We get most excellent results in both corn and potatoes."—*Wilmer Atkinson, Farm Journal.*

"Under average conditions, and in far the greater number of cases, we do not hesitate to name the Mapes Potato Manure as the **Best and Most Profitable** fertilizer for Potatoes."—*American Agriculturist.*

"The Mapes Potato Manure is certainly as good a fertilizer for the crops as we can expect to find."—*J. T. Lovett, Orchard and Garden.*

"Its action **Approaches Certainty**, or as near it as any manure can be expected to do."—*E. S. Carman, Rural New Yorker.*

"Our own experience with various commercial fertilizers has convinced us that with judicious use of the Mapes Manures worn-out lands can be **Restored to Fertility Quicker and with less expense** than in any other way."

"The remarkable success which has attended the Mapes fertilizers has given them an enviable reputation and standing, not only in the United States and Provinces, but in Great Britain and other European countries."—*American Agriculturist.*

"Mr. Mapes has studied industriously and has worked conscientiously to help the farmers. I believe he has tried as hard to serve the farmer's true interest as any one in this room. He knows how to make good fertilizers adapted to their needs, and he is making as good ones as he knows how to make. *They are reliable and may be depended upon. You may be sure of getting what you buy—getting what is guaranteed. I am glad to stand here and authoritatively make these statements.*"—**PROF. GEORGE H. COOK, DIRECTOR OF THE NEW JERSEY STATE AGRICULTURAL STATION**, at a meeting of the State Board of Agriculture, at Trenton, N. J.

"As between Mapes Potato Manure and stable manure the past season," says Alfred Rose, whose crop, 1,031 bushels per acre, won the *Farm Journal* prize, "there was a vast difference in favor of the former—more than half." It is coming to be a well-recognized fact that a complete fertilizer, such as Mapes, gives surer results than stable manure in growing potatoes. This accords with our own experiments for the past four seasons.—[From the *Farm Journal*, February, 1890.]

"Carefully compounded manures, like the Mapes, which contain large proportions of potash and phosphoric acid, and with these the nitrogenous portions in *the best* forms for the use of plants, make Fruit Trees and Fruit Vines that are strong and well developed in all their parts, just as proper food builds a man or horse as he should be. Mr. Mapes emphasizes the fact that *rapid growth does not mean fruiting power*; that the *forcing manures* weaken rather than strengthen the productive faculties of fruit plants, and also *impair their strength to resist disease, insects, and bad weather.*"—*The American Garden.*

"As we have said repeatedly already, purchasers of the Mapes products may rely on securing goods of the highest grade, most skillfully prepared on a very large scale, with all possible appliances for thorough and economical work—and honestly sold with the purpose of retaining any chance purchaser as a regular customer when he sees the results on his own fields."—*The Country Gentleman.*